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# 2018 Investor and Analyst Meeting

**Thursday, June 7**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:15</td>
<td>Pick-up from hotels</td>
<td></td>
</tr>
<tr>
<td>9:00 - 9:30</td>
<td>Welcome</td>
<td>Raimon Grifols Roura</td>
</tr>
<tr>
<td>9:30 - 10:00</td>
<td>Introduction</td>
<td>Lafmin Morgan</td>
</tr>
<tr>
<td>10:00 - 12:00</td>
<td>Commercial Strategies</td>
<td>Joel Abelson, Carsten Schroeder, Robert Jagt</td>
</tr>
<tr>
<td>12:00 - 12:30</td>
<td>Q&amp;A</td>
<td></td>
</tr>
<tr>
<td>12:30 - 1:30</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>1:30 - 2:15</td>
<td>Plasma Procurement Strategy</td>
<td>Peter Allen, Eduardo Herrero</td>
</tr>
<tr>
<td>2:15 - 3:00</td>
<td>Bioscience Manufacturing Operations</td>
<td>Oriol Duñach</td>
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<tr>
<td>3:00 - 3:30</td>
<td>Diagnostic Industrial</td>
<td></td>
</tr>
<tr>
<td>3:30 - 4:00</td>
<td>Break</td>
<td>David Bell, Antonio Martínez</td>
</tr>
<tr>
<td>4:00 - 6:00</td>
<td>Innovation</td>
<td>José Terencio</td>
</tr>
<tr>
<td>6:00 - 6:30</td>
<td>Q&amp;A</td>
<td></td>
</tr>
<tr>
<td>6:30 - 7:30</td>
<td>Site Tour</td>
<td></td>
</tr>
<tr>
<td>7:30</td>
<td>Dinner</td>
<td></td>
</tr>
</tbody>
</table>
# 2018 Investor and Analyst Meeting

**Friday, June 8th**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Pick-up from hotels</td>
<td></td>
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<tr>
<td>8:30 - 8:45</td>
<td>Welcome</td>
<td></td>
</tr>
<tr>
<td>8:45 - 9:45</td>
<td>Innovation</td>
<td>David Bell</td>
</tr>
<tr>
<td>9:45 - 11:15</td>
<td>Research Studies on Albumin</td>
<td>Dr. Arroyo / Montserrat Costa</td>
</tr>
<tr>
<td>11:15 - 12:00</td>
<td>Product Showroom</td>
<td>Carlos Roura / Daniel Fleta</td>
</tr>
<tr>
<td>12:00 - 12:15</td>
<td>Financials</td>
<td>Alfredo Arroyo</td>
</tr>
<tr>
<td>12:15 - 12:45</td>
<td>Q&amp;A</td>
<td>Victor Gríols Deu</td>
</tr>
<tr>
<td>12:45 - 1:30</td>
<td>Lunch</td>
<td></td>
</tr>
</tbody>
</table>

## Introduction

**Driving Value Through Strategic Acquisitions**

Raimon Grifols Roura  
Co-CEO
Driving Value Through Strategic Acquisitions

Access Biologicals

- January 2017
- 49% stake
- USD 51m
- 70 employees
- Manufacture of biological products for non-therapeutic uses, including plasma reagents to support specific in-vitro diagnostic and R&D activities
- 5-years call option

Driving Value Through Strategic Acquisitions

Share of NAT Technology Unit

- January 2017
- Acquisition of the share of the NAT technology donor screening unit, transforming diagnostic into a vertically integrated high-margin business
- USD 1,850m
- 175 employees
- Vertical integration of the NAT business with the acquisition of R&D, assay and instrument manufacturing activities based on NAT technology
### Driving Value Through Strategic Acquisitions

**6 plasma donation centers (Kedplasma)**

- February 2017
- 100%
- USD 47m
- 234 employees
- 6 plasma donation centers in the U.S.
- 300,000 liters

---

**GigaGen**

- July 2017
- 44% stake
- USD 35m
- 17 employees
- Biopharmaceutical company based in the U.S. specialized in the development of novel innovative monoclonal and polyclonal antibody therapies
Driving Value Through Strategic Acquisitions

Kiro Grifols

• July 2017
• Stake increase from 50% to 90%
• Euro 12.8m
• 54 employees
• Technology-based company based in Mondragón (Gipuzkoa, Spain), specialized in the development of instrumentation to automate and control hospital pharmacy processes

Driving Value Through Strategic Acquisitions

MedKeeper

• January 2018
• 51% stake
• USD 98m
• 50 employees
• Technology firm based in the U.S. that develops mobile and web-based solutions to enhance hospital pharmacy operations
Driving Value Through Strategic Acquisitions

Haema

- March 2018
- 100%
- EUR 220m
- 1,100 employees
- With 35 centers, it operates the largest independent network of plasma donation centers in Germany and offers a wide range of transfusion medicine services
- 800,000 liters

Driving Value Through Strategic Acquisitions

Agreement with Boya Bio-Pharmaceutical

- May 2018
- EUR 25m
- Agreement to build and manage plasma collection centers in China, meeting the criteria established by health authorities in the United States, the European Union and China
Commercial Strategies to Deliver Consistent Growth

Agenda

- Introductions and Opening Comments
- Division Overview:
  - Bioscience
  - Diagnostic
  - Hospital
- Panel Discussion
- Closing Comments
Commercial Leadership Team
Experienced Leadership

Joel Abelson
President
Bioscience Commercial Division

Carsten Schroeder
President
Diagnostic Commercial Division

Rob Jagt
President
Hospital Commercial Division

Grifols Is a Leader in Key Markets
Leading Market Shares in Major Segments

Grifols leads its market segments
- Global leader in plasma proteins
- Global leader in NAT technology
- A global leader in transfusion medicine
- Safety and quality continues to be a differentiating factor for Grifols products
Growth Momentum Continues
Commercial Portfolio Is Strengthened With New Growth Drivers

Underlying demand continues to support growth

- Grifols has made investments to support growth
- Grifols is transforming the Hospital Division
- Grifols’ growth accelerated significantly in 2017
- Sales volume in 2017 grew in all regions where Grifols operates

Opportunity

Grifols is positioned for continued growth

- Dedicated teams seeking to achieve the company’s mission
- Focus on diagnosis, treatment and geographic expansion continues to successfully deliver market growth
- **ONE GRIFOLS**: Cross divisional collaboration and new products are increasingly a source of differentiation
- Technology application is generating new avenues of growth
Bioscience Division
Delivering Consistent Growth

Joel Abelson
President, Bioscience Commercial Division

Continued Sales Growth
Grifols Bioscience Revenue Grew More than 7% CAGR Since 2015

All data at constant currency (CC), which excludes the impact of exchange rate movements.
Comparable net revenues at March 31, 2018 exchange rate: 1EUR=1.2348USD
Bioscience Growth Fundamentals Remain Strong
Leading Position Within Its Core Business of Plasma-Derived Therapies

<table>
<thead>
<tr>
<th></th>
<th>Global Market Share¹</th>
<th>Grifols Global Position</th>
<th>U.S. Market Share¹</th>
<th>Grifols U.S. Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunoglobulin</td>
<td>23%</td>
<td>#1</td>
<td>32%</td>
<td>#1</td>
</tr>
<tr>
<td>Alpha-1</td>
<td>67%</td>
<td>#1</td>
<td>65%</td>
<td>#1</td>
</tr>
<tr>
<td>pdFVIII</td>
<td>20%</td>
<td>#1</td>
<td>55%</td>
<td>#1</td>
</tr>
<tr>
<td>Albumin</td>
<td>17%</td>
<td>#2</td>
<td>20%</td>
<td>#2</td>
</tr>
</tbody>
</table>

Per capita utilization and diagnosis are growing for IVIG, albumin and alpha-1

Market growth and expansion strategies continue to deliver results
Grifols continues to invest in the Bioscience Division to sustain growth

1.- Market shares in revenues
Source: Grifols internal provisional data, 2017

Bioscience Growth Fundamentals Remain Strong
Product Strategies Will Deliver Continued Growth

**Immunoglobulin**
- Grifols has a leading share in the U.S. IVIG market and top position in the expanding U.S. CIDP segment
- Preparing to launch its 20% SCIG offering in 2019

**Albumin**
- Grifols leads the industry in clinical investments - results forthcoming in 2018 (AMBAR & ANSWER)
- Grifols is preparing to launch albumin in bags in the U.S. in 2019

**Alpha-1**
- Grifols continues to invest in appropriate testing, diagnosis and treatment
- FDA approval of Prolastin®-C Liquid builds upon Grifols’ position as the market leader of alpha-1 augmentation therapies

**pdFVIII**
- Hemophilia A treatment paradigm is evolving, with use focused on certain patients and clinical situations like PUPs¹, prevention & eradication of inhibitors and VWD²
- Volume growth continues in emerging markets driven by higher rates of diagnosis

¹.- PUP’s; previously untreated patients
².- VWD; Von Willebrand disease
Momentum in IVIG per Capita Utilization Continues
Top 10 Countries in Per Capita Utilization of IVIG in 2017 vs. 2013

- Top markets in per capita utilization are growing at high rates
- Aging demographics fuel IG growth
- Growth continues in 2017:
  - U.S.: +13%
  - Germany: +7%
  - Spain: +15%
- Full global demand for Grifols products in 2017 could not be met due to tight plasma supply. Grifols is now positioning to fully leverage this opportunity

Source: Grifols internal provisional data, 2017
IVIG Remains the Backbone of the U.S. IG market
Over the past 4 years, approx. 80% of U.S. volume growth was in IVIG vs. SCIG

Growth in the U.S. IG market

![Chart showing growth in the U.S. IG market from 2013 to 2017]

Source: Grifols internal provisional data, 2017

Leading in PIDD
Despite 7+ Years of SCIG, IVIG Remains Important for PIDD Patients

<table>
<thead>
<tr>
<th>PIDD Patient Treatment Estimates</th>
<th>Market Share IVIG PIDD Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVIG: 51%</td>
<td>Grifols: 28%</td>
</tr>
<tr>
<td>SCIG: 49%</td>
<td>Company 1: 34%</td>
</tr>
<tr>
<td></td>
<td>Company 2: 17%</td>
</tr>
<tr>
<td></td>
<td>A/O Companies: 21%</td>
</tr>
</tbody>
</table>

Grifols is a leader in PIDD and well positioned for success with a new 20% SCIG in 2019

Sources: "Insights and Postulating research, April 2018
**2017 Lexis-Nexis, Medical claims data only; Gamunex® C data includes GammaKed due to shared J-code
Leading in CIDP
Gamunex®-C Is Recognized as the Leading IG Treatment for CIDP

Gamunex®-C Continues to Drive Growth in CIDP Segment

CIDP Procedure Volume

Source: Lexis-Nexis, Medical claims data only; Gamunex®-C data includes GammaKed® due to shared J-code
Leading in CIDP
With SCIG in CIDP, Physicians Appear Cautious: Patient Profile Is Different

SCIG may require up to 8 sites and 8 needles
Gamunex® offers 1 site, 1 infusion, every 3 weeks

Grifols Maintains a Leadership Position in IVIG Globally and in the U.S., the World’s Single Largest Market

- Growth fundamentals remain strong: continued per capita utilization growth across key countries, U.S. CIDP segment
- IVIG remains the backbone of overall IG market
- Investments in plasma collection and robust plasma growth: Grifols is poised to capture global IG demand opportunities
- Grifols will launch a 20% SCIG product in 2019 and take an active role in this expanding segment in PIDD
**Grifols IG HyperRAB® (300 IU/mL)**
The First Advancement in Rabies IG Administration in More than 40 Years

**NEW** Rabies 300 IU/ML provides patients with ½ the Volume & 2X the Antibodies Delivered at the Wound Site

Grifols HyperRAB® is the #1 prescribed rabies immune globulin in the U.S. with more than 90% market share

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**Grifols Alpha-1 Antitrypsin**
Opportunity Remains Significant
Leading Position in Alpha-1 Deficiency Treatment (AATD)

As many as **350k symptomatic COPD** patients worldwide may suffer from severe **AATD** as a result of COPD; however, **fewer than 10% of them have been identified**

Significant opportunity still remains to increase diagnosis of AATD patients

---

Grifols Is the Global Market Leader in Alpha-1
After 10 Years of Competition, U.S. Prolastin®-C Continues to Lead and Drive Growth

2016 Alpha-1 Volume: 1,790 grams

2016 U.S. Alpha-1 Market Share

Source: Marketing Research Bureau, July 2017
In Europe, Prolastin® Retains More Than 90% Market Share Despite 2 Years of New Competition

Europe Alpha-1 Market Share (Patients)

- Grifols continues to consolidate its leadership position in the alpha-1 market with 66% global share, which is increasing revenue efficiency per liter
- Significant global opportunity for diagnosis and treatment: fewer than 10% of potential alpha-1 patients identified
- New and underdeveloped markets form a core component of Grifols growth strategy
- Recent FDA approvals reinforce Grifols' position as the market leader of alpha-1:
  - FDA approval obtained for Prolastin®-C Liquid, with launch scheduled in mid-2018
  - FDA approval of a new alpha-1 genetic diagnostic test developed by Diagnostic Division
- Global expansion of U.S. Prolastin Direct® model based on comprehensive and personalized patient support programs
Momentum in Albumin Per Capita Utilization Continues
Top 10 Countries in Per Capita Utilization of Albumin in 2017 vs. 2013

- Albumin use continues to grow in most key countries
- World’s largest market (China) has reached top 10 by per capita consumption
- Grifols is a global leader with strong market positions in the U.S. and China
- New clinical data will fuel future growth

Source: Grifols internal provisional data, 2017
Grifols’ Growth in China Has Outpaced the Market
The World’s Largest Market is Currently in Top 10 by Per Capita Consumption

Albumin Will Continue to Be a Driver of Bioscience Growth

- Leading position with market demand estimated to grow by 6-8% CAGR
- Growth driven by U.S. and China, where Grifols expects above-the-market growth
- Grifols is investing in a market expansion strategy to extend its reach to Chinese hospitals. The two-invoice system implemented in the country does not affect Grifols since it already complied with these provisions, a circumstance that the company has been able to leverage
- Developing countries are expected to grow at double-digit rates in the coming years
- Investment in albumin innovation:
  - Advancing science: research in Alzheimer’s, cirrhosis and other therapeutic areas
  - New packaging: albumin in bags launched in the U.S. in 2019
Grifols Holds Leading pdFVIII Position
Opportunities in a Changing Market

- Grifols holds leading global pdFVIII market share
- Grifols is a reliable partner for tender markets in all the indications: Hemophilia A (HA), ITI, and VWD
- pdFVIII is a cost-effective choice for prevention and eradication of inhibitors
- Focus on VWD indication in the hospitals with cost-efficiency benefits

Bioscience Revenue Breakdown

| pdFVIII |
|<10%|

pdFVIII Treatment Breakdown

- Tender market: 45%
- Commercial HA: 15%
- Commercial ITI: 15%
- Commercial VWD: 25%

1. ITI: Immune Tolerance Induction
Grifols Holds Leading pdFVIII Position

Hemophilia A Paradigm is Changing

• Several new novel therapies are in development that will impact future treatments. Gene therapy is on the horizon

• One new therapy offers benefits but also leaves clinicians with new questions that have implications for Grifols:
  o How to treat breakthrough bleeds in inhibitor and non-inhibitor patients?
  o Should inhibitors be eradicated in the presence of this new therapy?

• Grifols is working to inform and guide safe treatment options amid this changing paradigm

Grifols Holds Leading pdFVIII Position

Continuing Opportunity in pdFVIII Business

• A leader in hemophilia medicines, Grifols focuses on providing safe treatment options in the evolving treatment paradigm

• KoLs agree on the importance of eradicating inhibitors. Their feedback is “every patient deserves at least one ITI, at least one should be tried, or at least offered to patients”

• Significant opportunity for pdFVIII/VWF continues for patients and clinical situations:
  o Prevention and eradication of inhibitors and von Willebrand disease (VWD)
  o Potential role for pdFVIII in combination with new therapies

• Further opportunity for pdFVIII growth in emerging markets, where new patient growth will continue at approx. 5-6% due to increased diagnosis and improved treatment protocols

• Grifols pdFVIII continues to focus on:
  o Market access activities to reinforce the value of pdFVIII/VWF therapies (SIPPET study)
  o Participation in global tenders and new market opportunities (i.e. India)
## Key Takeaways
### Delivering Consistent Growth

<table>
<thead>
<tr>
<th>Growth</th>
<th>Opportunity</th>
<th>Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Underlying demand for key proteins supports consistent growth</td>
<td>• Leading efforts to expand markets through appropriate diagnosis and treatment</td>
<td>• Grifols holds #1 global share position for IG, alpha-1 and pdFVIII, #2 for albumin</td>
</tr>
<tr>
<td>• Grifols’ positioning for growth following significant plasma supply investments</td>
<td>• Grifols is widening its portfolio: launching Prolastin®-C Liquid; new rabies product; 20% SCIG and albumin in bags in the U.S. in 2019</td>
<td>• Grifols is the U.S. market leader: IVIG and the CIDP segment</td>
</tr>
<tr>
<td></td>
<td>• Research programs will deliver new opportunities in the future</td>
<td>• Grifols leads the industry in research for new protein indications and formulations</td>
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</table>
Diagnostic Division
Delivering Consistent Growth

Carsten Schroeder
President, Diagnostic Commercial Division

Driving Profitable Growth
Solid Mid-Single Digit Growth Over the Last Four Years

<table>
<thead>
<tr>
<th>2017 Revenue</th>
<th>2014-2017 Revenue Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>€732m</td>
<td>CAGR: 5.7%</td>
</tr>
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</table>

6.8%¹ (cc) vs. 2016

¹. Comparable net revenues considering intersegment sales
Transfusion Medicine Comprises ~95% of the Business
Donor Screening, Immunoassays & Immunohematology Are Grifols Core Businesses

Global Leader in Transfusion Medicine
Building a Specialty Diagnostics Portfolio
**Vertical Integration of NAT Blood Donor Screening Unit**

Assay Development and Manufacturing Aligned to Respond to Customers Needs

**PRE-ACQUISITION**

- Revenue share agreement

**GRIFOLS**

- Assay development
- Assay manufacturing
- Instrument development

**VERTICAL INTEGRATION**

**GRIFOLS**

- Assay development
- Assay manufacturing
- Distribution
- Sales & Marketing
- Service
- Instrument co-development

Grifols has the capability to develop and manufacture tests tailored to specific customers needs

---

**Global Leader in NAT Donor Screening**

NAT Adoption Increased by 1 Million Donations in 2017

- **Global Market Split (~94 million donations*)**
  - Adopted: 77%
  - Unadopted: 23%

- **Global Share of Adopted (~75.5 million donations)**
  - Grifols: 55%
  - Roche: 22%
  - Others: 23%

Grifols continues to lead the global NAT donor screening, holding a 55% market share

- **70+ donations tested every minute with a Procleix assay**
- **200+ people impacted every minute**

*Source: Internal data
*Does not include plasma collection
NAT Continued Focus on Geographic Expansion
APAC and Middle East Have Fueled Growth

**Ultrio®, Ultrio Plus®, Ultrio Elite**
Reagent sales (in tests)

**Instruments installed**
(Tigris & Panther)

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>Saudi Arabia</th>
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<tbody>
<tr>
<td></td>
<td>2013</td>
<td>2013</td>
</tr>
<tr>
<td>2017</td>
<td></td>
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<tr>
<td>CAGR:</td>
<td>15%</td>
<td>CAGR: 68%</td>
</tr>
</tbody>
</table>

**CAGR:**

- **China:** 15%
- **Saudi Arabia:** 68%

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Committed to Ensuring Safety of the Blood Supply
Procleix Zika and Babesia NAT Tests Used Under IND¹ in the U.S.

**ZIKA**

- **9.6m Donations tested in 2017**
- **16 Testing sites**

**BABESIA**

- **240k Donations tested (7/2017-3/2018)**

**Sites:**
- American Red Cross²
- Creative Testing Solutions
- Rhode Island Blood Center

**States:**
- NY, RI, NJ, PA, FL

¹ - IND: Investigational New Device
² - Now part of Creative Testing Solutions
NAT Plasma Donor Screening Represents a Growth Opportunity
Grifols Has Developed a Dedicated Team

Share of Tested Liters of Plasma

- Grifols: 18%
- Others:

NAT plasma testing market is growing with the industry

Plasma Testing Regulatory Status

- China: On going clinical trial
- U.S.: Launching in 2H 2018

Source: International directory of plasma fractionators 2015 Market Research Bureau report

Leader in Antigen Supply for Immunoassays
Worldwide Market Leader in Hep/Retro Immunoassay Antigens*

Antigens Shipped (grams)

<table>
<thead>
<tr>
<th>Year</th>
<th>Antigens Shipped</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>123</td>
</tr>
<tr>
<td>2017</td>
<td>134</td>
</tr>
</tbody>
</table>

CAGR: 4%

Profit Share Agreement (until 2039)

<table>
<thead>
<tr>
<th>GRIFOLS</th>
<th>Ortho Clinical Diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCV &amp; HIV patents</td>
<td>Assay development and manufacturing</td>
</tr>
<tr>
<td>Antigen research, manufacturing and supply</td>
<td>Instrument development and manufacturing</td>
</tr>
<tr>
<td>Assay research support</td>
<td>Product commercialization</td>
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Future growth drivers:

- CDMO: Contract Development Manufacturing Operations in diagnostics and therapeutics markets
- Continuous expansion of antigens portfolio

Immunohematology (IH) Continues as a Key Growth Driver
Grifols Sold a Record Number of Gel Cards in 2017

Gel Cards Sold

CAGR: 14%

2013 2014 2015 2016 2017

DG Gel ABO Rh Global  DG Gel ABO Rh (2D)  DG Gel AB (x4)
DG Gel ABO CDE  DG Gel Rh Pheno Global  DG Gel Anti-IG

Investments in Sales, Marketing and Service Are Paying Off

Live Sites

6 42 86 127

2015 2016 2017 1Q 2018

x2

Gel cards sold
(1Q 2018 vs. 1Q 2017)
Immunohematology Innovation: Eflexis®
Fully Automated, Flexible, Mid-sized Analyzer

The Eflexis® performs pre-transfusion compatibility testing using DG Gel® technology with a smart and compact design offering intuitive operations.

A fully automated, medium-sized analyzer for performing pre-transfusion compatibility tests. Eflexis® is the natural evolution in Grifols scalable blood typing solutions.

Immunohematology Innovation: Eflexis®
Well-received: 90+ Customer Placements in Europe¹ One Year After Launch

- 90+ Instruments sold
- 60% Competitive conversions
- 19 Countries*

Upcoming portfolio updates:
- New version of Erytra® software with improved features
- New middleware solutions worldwide
- New reagent blood cells and antisera to support U.S. expansion

¹ U.S. clinical trial ongoing
Immunohematology Competitive Advantage: Lab and IH Center
An Industry Reference That Supports Grifols Immunohematology Strategy and...

Grifols clinical laboratory and IH center, San Marcos, Texas

4,000 samples vs. 2016

x4 times

Services
- Immunohematology testing services for blood banks, hospitals and physicians
- Reference lab for discrepancies and complex cases

Test Menu
- Molecular and serological panels
- Novel assays for immunohematology

...The Grifols Academy of Immunohematology a Recognized Center for Education

The Grifols Academy of Immunohematology offers courses to transfusion medicine professionals to help them build a stronger workforce and equip them with tools to deliver higher-quality patient care

13 courses

+1,000 attendees
Hemostasis: Beckman Launches Promotional Activities in Key Markets
Grifols Makes Inroads with Product Registrations in Core Markets

• In 2017, Grifols reached an exclusive worldwide distribution agreement with Beckman Coulter for the global distribution of Grifols’ hemostasis instruments, reagents and consumables

• Grifols is currently working on the registration of these products in key markets, including the U.S. and China

• In preparation for product launch in Europe, Grifols has delivered technical service and sales training to Beckman. Sales activities have commenced in EU countries

Clinical Diagnostics: Promonitor® a Growth Driver in the Portfolio
Investment in a Dedicated Sales Force Is Paying Off

PROMONITOR® ELISA test offers key information about drug bioavailability and immunogenicity in patients prescribed with biological therapy for the treatment of chronic inflammatory diseases and other indications

Sales growth
15%
(2017 vs. 2016)

Budget impact model

NHS Scotland
6,000 Patients
**Clinical Diagnostics: New Product Launches Are Key to Growth**

Expanding Portfolio to Meet Evolving Customer Needs

<table>
<thead>
<tr>
<th>Key Product Launches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antisera in the U.S.</td>
</tr>
<tr>
<td>IDCoreXT</td>
</tr>
<tr>
<td>Eflexis®</td>
</tr>
<tr>
<td>Erytra® 4.1 Software</td>
</tr>
<tr>
<td>Helios assays</td>
</tr>
</tbody>
</table>

**Global Leader in Transfusion Medicine**

Future Growth Opportunities

- **NAT expansion**
  - Emerging pathogens
  - Plasma
  - Geographic expansion

- **Immunohematology growth plan**
  - Erytra® and Eflexis® Manufacturing in the U.S.

- **Leader in transfusion medicine**
  - Immunohematology
  - Molecular testing
  - Serology testing (SMC™ Singulex)
Strong Position and Reputation in Iberia and LATAM

Strong Legacy Business - Spain

- Broad portfolio:
  - Pharmatech
  - IV therapy base
  - Medical devices
  - Clinical nutrition
- Advanced hospital pharmacies
- Established leaders; learning, trialing
- Manufacturing and engineering advantages
Well Positioned for Sustained Penetration in the U.S. Market
U.S. Market Drivers Align With Grifols’ Strengths: Safety, Quality and Engineering

- Novel Pharmatech portfolio meets customer needs - alignment of trends/tailwinds
  - Regulatory demands increasing
  - Personalized medicine growing
  - Accountability to measure outcomes
- System for improving compounding control: quality, safety, efficiency, outcomes

---

A Clear Path Forward Through a Growing Product Portfolio
Key Events and Milestones of 2017 and Early 2018

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2017</td>
<td>U.S. IV solution market access</td>
</tr>
<tr>
<td></td>
<td>FDA approved Grifols manufactured saline</td>
</tr>
<tr>
<td></td>
<td>Establishing self-sufficiency for Bioscience</td>
</tr>
<tr>
<td></td>
<td>Optimizing plant capacity</td>
</tr>
<tr>
<td></td>
<td>Evaluating additional export opportunities</td>
</tr>
<tr>
<td>July 2017</td>
<td>Additional 40% stake</td>
</tr>
<tr>
<td></td>
<td>Kiro Grifols is a technology-based company focused on the development of machinery and equipment designed to automate hospital processes</td>
</tr>
<tr>
<td></td>
<td>Total stake 90%</td>
</tr>
<tr>
<td>January 2018</td>
<td>Cloud-based software applications</td>
</tr>
<tr>
<td></td>
<td>Solutions that optimize operational efficiency, increase process safety, improve communications throughout the value chain and enhance compliance</td>
</tr>
</tbody>
</table>
**MedKeeper: Accelerating Execution of Software Platform and System Strategy**

- **Verification**: Improves compliance and quality with batch and patient-specific IV compounding utilizing volumetric or gravimetric verification.

- **Training**: Supports pharmacy leadership's oversight of staff training and competency management.

- **Web and Mobile Solutions**: Real-time reporting and analytics fits existing workflows.

- **Compliance | Process | Safety | Flexibility**

**Complete Solutions to Meet IV Compounding Needs**

Improving Safety, Quality, Efficiency, and Compliance With New, Strict Regulations

<table>
<thead>
<tr>
<th>Clean Room Environment</th>
<th>Workflow</th>
<th>Automation</th>
<th>Material Management</th>
<th>Quality Assurance</th>
<th>Data &amp; Insights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air N Space</td>
<td>PhocusRx</td>
<td>Kiro</td>
<td>DosiFuser</td>
<td>DosiFuser</td>
<td></td>
</tr>
<tr>
<td>CIMScan</td>
<td></td>
<td>Oncology</td>
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<td></td>
<td></td>
<td>KiroFill</td>
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<td></td>
<td>Grifill</td>
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<tr>
<td></td>
<td></td>
<td>CIMScan</td>
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<td></td>
<td>StocKey</td>
<td></td>
<td>CIMScan</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>StocKey</td>
<td></td>
</tr>
<tr>
<td><strong>MedKeeper suite of apps</strong></td>
<td></td>
<td><strong>Kiro LINK</strong></td>
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</tr>
<tr>
<td>CIMScan</td>
<td>Silicon (CPOE)</td>
<td></td>
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</tr>
<tr>
<td><strong>Software</strong></td>
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<tr>
<td><strong>Services</strong></td>
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<tr>
<td>Misterium</td>
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<td>Consulting/Consulting/</td>
<td></td>
<td>Consulting/Consulting/</td>
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<tr>
<td>Grifols Engineering</td>
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<td>Grifols Engineering</td>
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<td></td>
<td></td>
<td>Grifols Engineering</td>
<td></td>
<td>Grifols Engineering</td>
<td></td>
</tr>
</tbody>
</table>

1. CPOE: Computerized physician order entry
MedKeeper Will Continue to Grow with IVWF Adoption

IV Workflow Management Adoption Is Expected to Accelerate

Division Strategy Accelerates Growth and Strengthens Contribution

Enlarging the Hospital Division

**Near-Term Milestones:**

Accelerated growth through portfolio improvements with software commercialization that increases U.S. market opportunity to >$1B

**Mid- to Long-Term Milestones:**

Accelerated sales from North America and from innovative, customer-valued technologies lead to consistent positive EBIT growth over 5 years
Pharmatech Business Underpins Growth
Enhancing Hospital Portfolio

CAGR: +4.8%

Pharmatech 40

IVTherapy 37

Contract Manufacturing 9

Others 19

2017 vs. 2015 CAGR

+5.7%

+1.0%

+75.5%

-4.1%

2015 2016 2017

Consolidating Footprint in the U.S. Market
While Remaining Strong in Spain

CAGR: +4.8%

North America 106

IBAM 90

ROW 3

2017 vs. 2015 CAGR

+46.2%

+1.9%

-7.2%

2015 2016 2017

2017 and 2016 comparable net revenues considering intersegment sales
Successful Strategy Execution
1Q 2018 Revenue Accelerated, Driven by North America

(EUR in millions)

Q1 '17

Q1 '18

North America (+353.8%)

IBAM (-5.0%)

Others (+16.4%)

2017

• Achieved EUR 106 million in sales; CAGR (2015-2017): 4.8%

• Key milestones and events:
  o Gained U.S. IV solution market access: FDA approval; self-sufficiency at Grifols’ donor centers and third-party distribution agreement
  o Kiro Grifols stake increased to 90%
  o MedKeeper 51% acquisition, announced in January 2018

2018 and beyond

• 1Q 2018 U.S. sales up c.350%, NA Pharmatech sales doubled and saline launch demonstrates impact

• Sustaining leadership in Iberia / LATAM while U.S. becomes greatest source of growth

• Delivering innovative and customer-valued solutions

• Benefiting from tailwinds in IV compounding control that will support sustained performance over time

Key Takeaways
Delivering Results of a Transformation
Commercial Strategies Panel Discussion
Bioscience, Diagnostic and Hospital

Commercial Leadership Team

Commercial Strategies Panel Discussion
Topics of Focus

One Grifols
• Cross-Divisional Collaboration
• Team Synergies

Commercial Themes
• Customer Centricity
• Leveraging Technology

The following slides have been prepared to support the commercial strategies panel discussion
One Grifols: Cross-Divisional Collaboration
Normal Saline Launch in U.S.
One Grifols: Cross-Divisional Collaboration

Albumin in Bags

- Ready-to-use, over-wrapped polypropylene bag has advantages for storage and administration in cases where glass vials present issues (crash carts, ambulances)

- Hospital Division shared technology with Bioscience
  - Plastic injection molding and production
  - Bag forming and plastic film overwrap

- Grifols Engineering partnered with Bioscience to implement
  - Machinery design and construction for aseptic filling
  - Process automation and robotization
  - Online radiation sterilization

One Grifols: Cross-Divisional Collaboration

Importance of Diagnosis: Alpha-1 Is the Major Known Genetic Risk Factor for COPD


THE LONGER AAT DEFICIENCY REMAINS UNDIAGNOSED, THE GREATER THE RISK FOR IRREPARABLE LUNG DAMAGE

Average interval between onset of pulmonary symptoms and diagnosis was 8.3 years.

Average number of physicians seen by patients before diagnosis was 2.7 physicians.
One Grifols: Cross-Divisional Collaboration
Alpha-1 Early Diagnosis and Treatment Deliver Multiple Benefits

More than 90% of patients may be undiagnosed

Grifols is staunchly committed to improving the under-diagnosis of AATD by educating HCPs and providing free, easy and comprehensive testing services

One Grifols: Cross-Divisional Collaboration
Progenika Provides the Testing Platform for Alpha-1

Grifols uses the Progenika technology to work with HCPs to increase testing for alpha-1 deficiency
One Grifols: Cross-Divisional Collaboration

Progenika Has Developed an Improved Assay for Alpha-1

**New test has CE and FDA approval**

**Test uses non-invasive samples**

- Buccal swab
- Customized Dry Blood Spot (DBS)

**Kits delivered to doctor’s office**

**Sample collected**

**Sample shipped**

**Web Platform**

**Report delivered to physician office**

**Sample processed**

---

**Model A**

Local partner laboratory

**Model B**

Service at Progenika laboratory

**Progenika Biopharma**

**Average tests per month**

<table>
<thead>
<tr>
<th>Year</th>
<th>Model A</th>
<th>Model B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>225</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>242</td>
<td></td>
</tr>
</tbody>
</table>

- **CAGR 38 %**

**Reduction on diagnostic times**

**Decrease need for sequencing**

**Positive user feedback**

**Significant reduction of laboratory turnaround time**

- **Previously TAT (days):** 60
- **A1AT Genotyping Test:** 5

**Pilot Study Data**

- **521 samples in approx. five weeks**
- **17 samples candidate to treatment**

---

**One Grifols: Cross-Divisional Collaboration**

Improving Alpha-1 Diagnosis: Partner With Local Laboratory and In-House Testing Services
# One Grifols: Multiple Collaboration Projects

**CLIA Lab in San Marcos, Texas, Provides Multi-Divisional Support**

<table>
<thead>
<tr>
<th>Grifols plasma special program</th>
<th>Araclon Biotech</th>
<th>Progenika Biopharma</th>
<th>ALKAHEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of donors with Rho D Antibody to produce Rho(D) Immune Globulin</td>
<td>CLIA validation for the investigation of Alzheimer’s disease</td>
<td>Validation of ID CORE XT PMA dossier for FDA</td>
<td>Clinical study on patients with mild-to-moderate Alzheimer’s disease</td>
</tr>
</tbody>
</table>

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### Commercial Themes

- **Customer Centricity**
- **Leveraging Technology**
Customer Centricity: Multi-Channel Marketing

The “Look Into Genetic COPD” Campaign

- Reaching targeted COPD patients is the biggest opportunity to accelerate the diagnosis of alpha-1
- Direct to consumer (DTC) multi-channel marketing campaign launched mid-2017
- Key messages motivate COPD patients to take two actions: order the AlphaKit and get tested by their healthcare provider (HCP)

Customer Centricity: Prolastin Direct®

Comprehensive, Personalized Support to U.S. Alpha-1 Patients

* AlphaNet: Not-for-profit organization providing health management services for the PROLASTIN DIRECT program led by alpha-1 experts and patients
Customer Centricity
Comprehensive Support Programs Also Offered ex-U.S.

Technology and Innovation Are at the Core of the Business
Strengthening the NAT portfolio
Automation Project Is Approaching Market Launch in 2019
Scalable Solutions Designed With Built-in System Redundancies for Variable Workflows

A modified Panther designed to:
- Connect to a network of Panthers
- Connect to track transport system
- Includes waste drain, MTU capacity, other software & hardware modifications

Track-based sample transport
- Working prototypes set up in San Diego
- Up to 16 Panthers

Panther AR is designed to interface with any CLSI-compliant track system

New Software Solutions to Simplify Customer Workflow
The Panther Dashboard Will Allow Tracking and Monitoring of Crucial Activities
Committed to the Safety of Blood and Plasma Supply

Working Continuously to Respond to Emerging Pathogen Threats

Emerging pathogens

Demonstrated leadership responding to Zika and Babesia

Arboplex testing

This assay is designed to simultaneously detect: Chikungunya, Zika and Dengue

In-house capabilities

Willow Court facilities (San Diego, CA)
New assay development
Assay manufacturing

Impact of Technology on Hospital Pharmacy Operations

Management of Solids and Liquids Require Different Solutions

<table>
<thead>
<tr>
<th>Oral Solids</th>
<th>Compounded IV Preparations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Computerized prescription order entry</td>
<td>• Highly manual (85-90%)</td>
</tr>
<tr>
<td>• Automated dispensing</td>
<td>• Paper-based documentation</td>
</tr>
<tr>
<td>• Inventory management systems software</td>
<td>• Unacceptable error rate</td>
</tr>
<tr>
<td>• Bar-coded medication administration</td>
<td>• High-risk preparations (intravenous)</td>
</tr>
</tbody>
</table>
Delivering Value Through Technology, Automation & Connectivity

New Gri-fill® 4.0 Delivers on Expectations of Technology Advancement

- Gri-fill® remains the only semi-automated compounder that maintains and documents sterility of compounded preparations
- Improved speed with additional, second peristaltic pump
- Newly redesigned with technology enhancements:
  - IoT / Connectivity with wifi and bluetooth
  - Integrates with hospital IT and EMRs
  - Enhanced touch screen and improved user interface

Advances in Fully Automated Compounding Devices

KIRO® Oncology
Impact of Technology on Hospital Pharmacy Operations

MedKeeper

Closing Comments
Delivering Consistent Growth

Lafmin Morgan
Chief Commercial Officer
Key Takeaways
Delivering Consistent Growth

Leadership

Grifols leads its market segments

- Global leader in plasma proteins
- Global leader in NAT technology
- A global leader in transfusion medicine
- Safety and quality continues to be a differentiating factor for Grifols products

Growth

Underlying demand continues to support growth

- Grifols has made investments to support growth
- Grifols is transforming the Hospital Division
- Grifols’ growth accelerated significantly in 2017
- Sales volume in 2017 grew in all regions where Grifols operates
Grifols is positioned for continued growth

- Dedicated teams seeking to achieve the company’s mission
- Focus on diagnosis, treatment and geographic expansion continues to successfully deliver market growth
- **ONE GRIFOLS**: Cross divisional collaboration and new products are increasingly a source of differentiation
- Technology application is generating new avenues of growth
Plasma Procurement Strategy
Capacity Leadership in Plasma to Optimize Growth

Peter Allen
President and CEO, Grifols Plasma Operations

Capacity Leadership in Plasma to Optimize Growth

Agenda

• Strong Performance and Business Improvements
• Market Analysis
• Plasma Procurement Strategy and Future Growth
• Business Development: Connections and Innovation
• Leveraging Technology to Drive Efficiencies
• Key Takeaways
Progress to Date
Main Achievements Lead to Strong Market Position

Grifols Plasma Procurement Is Strong and Well Positioned
Capacity Leadership Drives Growth Opportunities

- 40 additional centers since 2015
- Network of 190 centers expands to approximately 325 by 2023
- Strategically expanded collections to EU
- Enabled for strong self-sufficiency position
- Continuous improvement on collection fundamentals
- Excellence in logistics and lab testing; accuracy and throughput
- Improving efficiencies through technology and programs
Double-Digit Collections Growth With Strong Performance
Capacity Leadership Drives Growth Opportunities

- U.S. collections have increased significantly driven by the operational efficiencies
- By promoting a fully integrated and balanced plasma procurement organization, Grifols is showing a sustainable growth in plasma collection
- Operational efficiency improvements include continuous upgrades of plasma centers and customer service to increase donor recruitment and loyalty
- Continued focus on quality performance

U.S. Grifols Plasma Collection Performance in Liters
Growth Quarter over PY quarter

Focus on Growth Over the Last 3 Years Is Generating Results
Improving Collection Fundamentals

Qualified Donor Flowtime

Donor Frequency

Average Liters per Grifols U.S. Existing Centers
Index 100 = 2016

Opening Hours by Center

Optimize Equip. Turnover

2016 Q1 2018

2016 Q1 2018

2016 Q1 2018

2016 Q1 2018

2016 Q1 2018
Regulatory Inspections in 2017
Grifols’ High Standards Ensure Operational Efficiency and Sustainable Growth

<table>
<thead>
<tr>
<th>Agency</th>
<th>Inspection Days</th>
<th>Admin Actions(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDA(1)</td>
<td>265</td>
<td>0</td>
</tr>
<tr>
<td>EU</td>
<td>222</td>
<td>0</td>
</tr>
<tr>
<td>COLA/CLIA</td>
<td>108</td>
<td>0</td>
</tr>
<tr>
<td>PPTA</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td>Other(3)</td>
<td>48</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>703</td>
<td>0</td>
</tr>
</tbody>
</table>

Close to 100% of FDA inspections with “0” observations(4)

1. More than 90% of FDA inspections resulted in 0 observations
2. Suspension, revocation or loss of any license or certification; warning letter; imposed suspension of any regulated activity, etc.
3. State environmental agencies, OSHA, ex-US/EU Agencies
4. Number of FDA inspections with “0 issues (Form-483)

A proven track record: no administrative actions or other regulatory issues promote cost savings across the value chain

Systems Deployment Completed
In Place in 100% Centers

Grifols’ Donor Payment and Fundraising System

- Eliminates manual cash management at centers
- Near real-time financial transactions
- Improves financial controls
- Multi-cash card system reduces risk and dependency on a single banking solution provider
- Incorporates fundraising capability for donors community contribution and engagement

Biometrics Donor Health History Solution with Next Gen

- Eliminates donor manual wristbands efficiency saving of 1 FTE1 per center
- Biometric donor fingerprint capture for enhanced donor experience and safety
- Implements PPTA questionnaire Plasma Protein Therapeutics Association standard
- Electronic display of guidance image resources to donors

1. FTE= Full time equivalent employee
Increase in Collected Plasma Available
Organizational Efficiency Drives Significant Productivity Gains

Plasma rejected and downgraded¹

- Decrease of c.-38% of unsuitable plasma post collection by reducing testing turnaround time to less than 72 hours through Grifols NAT platform and investments in equipment and facilities
- Focus on process improvement, training and education of staff and donors
- Continuous improvements by monitoring of KPIs
- Quality program in place to attain further reductions in 2018-2019

¹ Plasma available for further fractionation but with some markets restrictions

Plasma Procurement Strategy
Expansion, Diversification and Key Improvements for Upcoming Years
Plasma Procurement Strategy: Expansion and Diversification
Capacity Leadership in Plasma to Optimize Growth Opportunities

- Grifols plans to open 10 new centers in Europe
- HAEMA currently operates 35 donor centers in 9 different German states and a laboratory for testing plasma and blood control. 3 donor centers under construction
- In 2017, Grifols established PLASMAVITA GmbH, a joint venture between Grifols (50%) and two European partners (50%)
- Grifols plans to open 10 new centers in Europe
Plasma Procurement Strategy: Expansion and Diversification
Grifols Plasma Donor Centers: Presence and Opportunities Ahead

Plasma Procurement Strategy
Focus on Grifols’ Competitive Advantage

Growth
- Acceleration in growth of plasma centers
- ↑ Number of donor centers
- ↑ EU plasma supply; diversifying supply
- Expand business development capabilities

Operational efficiencies
- Standardizing processes
- Continuous quality assurance best practices
- Leverage current and new technologies

Grifols Plasma Collections

<table>
<thead>
<tr>
<th>Index 100 – 2016</th>
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</thead>
<tbody>
<tr>
<td>2016</td>
</tr>
<tr>
<td>2023FC</td>
</tr>
</tbody>
</table>

x2
Plasma Procurement Strategy
Expanding Plasma Capacity While Working Toward Self-Sufficiency

Plasma Testing Laboratories: Capabilities and Efficiency
Focus on Optimizing Costs While Maintaining High Operational Integrity

Labatory processes are designed for controlled high-volume testing

- Combined testing capacity in the future with planned expansions and IBBI acquisition:
  - Up to 20 million annual donations
  - More than 168 million reported test results
- Excellent testing turnaround time to fewer than 72 hours
U.S. Plasma Market
Plasma Collection Growth

- Plasma collection has continued to be a large, growing industry year-on-year
- In 2017, the U.S. plasma market has collected c.35 million liters
- The number of donor centers reached 671 by the end of 2017
- Increasing collections and recruiting qualified staff are main challenges

1 Source: PPTA - The Plasma Protein Therapeutics Association data

Plasma figures corresponds to plasma from plasmaphoresis
**EU Plasma Market**

**Plasma Collection Growth**

- In 2017, the EU plasma market has collected c.2.5 million liters (Germany 1.7, Austria 0.5 and Czech Rep & Hungary 0.3 million liters)
- The number of donor centers reached 107 by the end of 2017
- Increasing collections and recruiting qualified staff are main challenges
- Main players, Haema, Octapharma, CSL, Biotest, TMD and KedPlasma

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**Plasma Procurement Strategy**

**Expanding Plasma Capacity**

**Opportunities for improved efficiencies**

- Improvement in operating efficiencies in U.S.
- Diversification to EU plasma supply provides efficiencies and optimization of cost per liter due to better operational cost and savings on ocean freights
Plasma Cost Management
Continuous Improvement of the Entire Value Chain to Promote Cost Containment

- Planned volume growth drives fixed cost leverage
- Maintain donor commitment compensation consistent with market
- Management of U.S. labor market consistent with the industry
- Process improvements and automations to further promote cost savings

Plasma Cost Structure

- Donor commitment compensation
- Direct labor
- Other operating costs

Plasma Cost Management
Continuous Improvement of the Entire Value Chain to Promote Cost Containment

- During 2015-2017 period, almost 40 new centers opened and integrated in the ramp-up process
- Focus on opening centers and volume growth
- Impact of new donor centers, donor commitment compensation and direct labor were the main drivers for the CPL increase over this period
- Demand growth lead to tightness in plasma supply

U.S. Plasma Cost Evolution

1. CPL Adjusted is not considering Donor Commitment Compensation, Direct Labor and New Donor Centers Impact
## Donor-Centric Strategy

### Enhance Donor Experience to Increase Productivity

<table>
<thead>
<tr>
<th>Commitment</th>
<th>Compensation</th>
<th>Loyalty</th>
</tr>
</thead>
</table>
| • All donors are heroes  
  Donors come to Grifols with a purpose: to fulfill a financial need; help others; or take part in something greater than themselves. We celebrate all donors! | • All donations are created equal  
  Grifols compensates all donors for their substantial commitment of personal time. Competitors base their compensation on weight | • Personalized experience drives loyalty  
  Innovative appointments program. Cadenced messages through CRM technology enhance connection; donor focus in center fosters family atmosphere |
**Loyalty**

Appointment Technology Differentiates Grifols’ Donor Experience

<table>
<thead>
<tr>
<th>Launch of First-of-Its-Kind Plasma Donor Appointment Program</th>
<th>Improvement of Automated Customer Relationship Management (CRM) Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Customized web and mobile-enabled</td>
<td>• Direct to donors</td>
</tr>
<tr>
<td>• Launched in select centers nationwide</td>
<td>• Robust content builds iteratively</td>
</tr>
<tr>
<td>• Schedule algorithm tailored for each center</td>
<td>• Real time messaging</td>
</tr>
<tr>
<td>• Donor choice balances workload</td>
<td>• Personalized messages - call-to-action; Donation frequency increased.</td>
</tr>
<tr>
<td>• Reduce processing times - donor loyalty</td>
<td>• Analytics illuminate opportunity areas</td>
</tr>
<tr>
<td>• Team scheduling predictability</td>
<td></td>
</tr>
</tbody>
</table>

**Engagement with the Community**

Expanded Community Outreach With More Than 1,000 Events

[Maps showing Q4 and Q1 Regional Community Outreach Engagement]
Build Learning Culture for Process Efficiency & Customer Service
Building Competitive Advantage Through Highly Skilled, Motivated and Engaged Staff

Center Leadership Development Program
- 6-month skills enhancement and development
- Shared learning and instruction experience
- Focus on donor and employee engagement

Accreditation
- Submitted; Institute for Credentialing Excellence (ICE)
- Program is substantially robust
- Aligned with global initiatives

The value of the education program lead industry players to participate in these education activities

Business Development: Innovation Process and Technology Improvements
**Plasma Productivity Journey**

**Journey Status - ON TRACK**

**Journey achievements**

- Core Systems identification and big picture comparison completed
- Plasma technology plan defined in alignment with 4 goals
- Strategic technology office established
- Business Process Management (BPM) tool selected:
  - Piloting: Two BPM solutions created
    - Donor Flow Tracking
    - Change Control Management

**Next Steps**

- Optimize business rules and decision action and accelerate results for high objective: BPM tool to manage process flows in real time. Enable actionable intelligent data for staff to take immediate action and accelerate results for high productivity
  - Data management improvement
  - Operations Intelligence improvement
  - Optimize business rules and decision management
  - Workforce mobility
  - Donor and staff engagement. Routine manual workflow automation

**Enabling Plasma Data Flow Management in Real Time**

**Trial of BPM Enables Actionable Data and Empowers Staff**

**Objective:** BPM tool to manage process flows in real time. Enable actionable intelligent data for staff to take immediate action and accelerate results for high productivity

- Data management improvement
- Operations Intelligence improvement
- Optimize business rules and decision management
- Workforce mobility
- Donor and staff engagement. Routine manual workflow automation
Collection Devices Upgrade
Improved Donation and Quality Performance

Replace current Plasmapheresis Devices to newer technologies available from Fresenius Kabi and Haemonetics

- The NexSys PCS¹ and Aurora Xi have improved quality and compliance with automated procedure when connected to BECS² system
- Faster procedure time and paperless donations
- Intelligent reporting and process optimization when using connected to BECS
- Improved donor comfort and safety
- Reduced machine downtime, improved usability, configurability, reliability and serviceability

Core BECS Systems Rationalization
Drive Towards One Core System

Define and implement BECS Standard

- Defined as the Core BECS system that provides higher contribution and alignment with long-term plasma strategic goals and performance
- Drive down cost per collection by rationalizing and focusing in one Core BECS System
- Ensure quality management and compliance
- Rationalize support, maintenance and integration efforts
- Reduce complexity and promote seamless staffing flows among centers
Key Takeaways

Capacity Leadership to Optimize Growth

**FOCUS ON SOURCING AND DIVERSIFICATION**
- Grifols is committed to maintaining its leadership through a sustainable growth in plasma collection by promoting a fully integrated plasma procurement organization
- Grifols is investing in new centers to continue the acceleration plan to reach approximately 325 by 2023
- U.S. collections increasing by double digits, driven by enhanced operational efficiencies
- EU plasma collections access key to diversify plasma supply
- Competitive advantage: building long-term inventory for business opportunities

**FOCUS ON EFFICIENCIES**
- U.S. plasma procurement continuous improvement combined with EU plasma synergies will drive efficiencies
- Operational efficiency improvements include continuous upgrades of plasma centers and customer service to increase donor recruitment and loyalty
- Excellent testing turnaround times and flexibility in testing laboratories
- Delivery of high-impact educational and professional opportunities for employees
Bioscience Manufacturing Operations
Capacity Leadership in Manufacturing to Optimize Growth

Eduardo Herrero
President, Bioscience Industrial Group

Bioscience Manufacturing Operations
Global Footprint

1.2+ million of plot area
4 Manufacturing sites
USD 700+ million In CAPEX investments in last 5 years
225+ Plasma collection centers across Europe and U.S.

13,000+ Staff in Bioscience operations
3,500+ Employees in manufacturing sites
450+ R&D employees
9,000+ Employees in plasma operations sites

State-of-the-Art Manufacturing Sites

Los Angeles, CA
Clayton, NC
Dublin
Barcelona
## Bioscience Manufacturing Operations

### Key Priorities

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Efficiencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fractionation capacity</td>
<td>• Process improvements evolution</td>
</tr>
<tr>
<td>• Key purification capacities</td>
<td>• Manufacturing cost per liter</td>
</tr>
<tr>
<td>• Fibrin sealant capacity</td>
<td>• Quality and safety driven</td>
</tr>
<tr>
<td>• Investing in growth</td>
<td>• Main achievements</td>
</tr>
</tbody>
</table>

### Bioscience Manufacturing Capacities
**Fractionation Capacity**
Capacity Leadership in Manufacturing to Optimize Growth Opportunities

- Given the long time to execute, validate and obtain approvals, it is key taking the right decision in advance of where, when, and for how much capacity a facility is built.
- Target fractionation capacity is plan to be achieved in 2022.

**Fractionation Capacity per Year**
(Million liters)

<table>
<thead>
<tr>
<th>Year</th>
<th>Barcelona</th>
<th>Los Angeles</th>
<th>Clayton</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>8.0</td>
<td>3.7</td>
<td>2.2</td>
</tr>
<tr>
<td>2018</td>
<td>14.8</td>
<td>2.4</td>
<td>5.0</td>
</tr>
<tr>
<td>2023</td>
<td>19.0</td>
<td>2.4</td>
<td>5.0</td>
</tr>
</tbody>
</table>

**New Fractionation Building (NFB) Project at Clayton (NC)**
Engineered for Maximum Efficiency and Flexibility

- Fractionation capacity: 6m eq/L plasma/year
- Two parallel plasma pooling and fractionation lines
- CAPEX: USD 90M
**Albumin Purification Capacity**

**Supporting Demand Growth**

- Protein purification capacity decisions aligned to fractionation capacity
- Los Angeles and Dublin facilities, along with manufacturing process improvements, are growth drivers of albumin purification capacity
- Product differentiation ensures up to 7 million liters in flexible containers
- Albumin fractionation ratio to increase over 100%

![Purification/Fractionation Capacity per Year](image)

**New Albumin Purification and Filling Facility in Dublin**

**Albumin in Flexible Containers: State-of-the-Art Facility for Global Supply**

- Purification and filling plant for 6m eqL plasma/year of albumin
- CAPEX: USD 85m
- 4 sterile filling lines for albumin in bags
- Implementation of continuous online process, from bag forming to pasteurization and sterilization, to enhance production efficiency

![New Albumin Purification and Filling Facility in Dublin](image)
**Immunoglobulin Purification Capacity**

Supporting Demand Growth

- Protein purification capacity decisions are aligned with fractionation capacity
- Los Angeles and Clayton plants and continuous improvement serve as growth drivers of immunoglobulin purification capacity
- Immunoglobulin fractionation ratio to increase over 100%

**Purification/Fractionation Capacity per Year**

(Million liters)

- 2011: 8.9 (112%)
- 2018: 11.8 (79%)
- 2023: 20.1 (106%)

- Immunoglobulin purification capacity
- Global fractionation capacity
- Immunoglobulin fractionation ratio

---

**New IG Purification and Filling Facility at Clayton**

First-in-Class Facility for the Next Generation of IGs

- World’s first facility for IGs in flexible containers
- Purification and Filling Plant for 6m eq.L plasma/year IG
  - Subcutaneous
  - Intravenous
  - Intramuscular
  - CAPEX: USD 120m

**Timeline**

- 2018: Shell construction
- 2019: Start-up
- 2020: Validation
- 2021: Approval
- 2022:
Factor VIII Purification Capacity
Supporting Demand Growth

- Protein purification capacity decisions aligned with fractionation capacity
- Clayton plant not significant investments in room upgrades together with Barcelona and Los Angeles process improvements are the drivers of the Factor VIII purification capacity growth

Purification/Fractionation Capacity per Year
(Million liters)

<table>
<thead>
<tr>
<th>Year</th>
<th>FVIII purification capacity</th>
<th>Global fractionation capacity</th>
<th>FVIII fractionation ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>7.1</td>
<td>8.0</td>
<td>89%</td>
</tr>
<tr>
<td>2018</td>
<td>10.2</td>
<td>14.8</td>
<td>69%</td>
</tr>
<tr>
<td>2023</td>
<td>13.5</td>
<td>19.0</td>
<td>71%</td>
</tr>
</tbody>
</table>

Factor VIII Purification Facilities in Clayton
Upgraded Processing Rooms and Repurposed Flows and Equipment

Non-VC (Zone 1) Area for Alphanate® in B300, Rooms 3012 & 3013
VC (Zone 2) Area for Alphanate® in B300, Room 3922
Alpha-1 Purification Capacity
Aligned With Fractionation Capacity

- Protein purification capacity decisions aligned with fractionation capacity
- Barcelona plant is the main growth driver of alpha-1 purification capacity

Alpha-1 Purification and Filling Facility in Barcelona
New Plant Provides Capacities for Alpha-1 Growth

- Purification and filling plant for 4.3m eqLplasma/year of Prolastin®-C
- New formulation for Prolastin®-C Liquid
- GSF® proprietary technology for aseptic filling operations
- CAPEX: USD 65m
- 80,000 square feet on 3 levels
Fibrin Sealant Manufacturing Capacity
Supporting Demand Growth

- Fibrin sealant manufacturing capacity fully covered by fractionation capacity
- Barcelona plant as the driver of the fibrin sealant manufacturing process

### Manufacturing Capacity of Thousands of Kits Over Next 5 Years

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>1,100</td>
</tr>
<tr>
<td>2023</td>
<td>9,000</td>
</tr>
</tbody>
</table>

Fibrinogen/Thrombin Purification and Filling Facility in Barcelona
Complete Upgrade to Increase Fibrin Sealant Presentations

- Capacity 1.7MM units per year
- Syringes of 2, 4, 6 and 10 ml formats
- New final product sterilization, packaging and warehousing areas
- Automated warehouse -30°C for 700 pallets
- CAPEX: EUR 27m
Investing in Growth
Barcelona, + 49,000m², +109% of Land Expansion

Investing in Growth
North Carolina, + 1.9 km², 200% of Land Expansion
Continuous Process Improvements Evolution (I)
Increasing Performance in Key Proteins

Improving albumin performance through manufacturing process homogenization across plants

Focus on Gamunex® translates to increases in overall immunoglobulin performance
Continuous Process Improvements Evolution (II)
Increasing Performance in Key Proteins

![Factor VIII Yield](image)
- **Factor VIII performance grows thanks to process improvements and Clayton facility efficiencies**

![Alpha-1 Yield](image)
- **Strong increase in Alpha-1 performance through high Prolastin®-C**

Manufacturing Cost per Liter
Leveraging Capacity Expansion

- Manufacturing cost per liter\(^1\) benefits from efficiencies over time and is able to absorb the annual cost of living
- Impact of new plants is leveraged by automation and process improvements

![U.S. Dollar per Liter](image)
- **1.6x**
- **0.99x**

1. Manufacturing cost per liter does not include amortizations and depreciations
Quality, Safety & Reliable Supply are Key Drivers of Sustainable Growth

A Core Value for Grifols

<table>
<thead>
<tr>
<th>Vertical integration</th>
<th>A strict in-process control framework</th>
<th>Robust supplier qualification program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure safety and quality throughout the process</td>
<td>Continuously monitoring the process, assessing KPIs, as well as GMP compliance status, deviations and CAPA</td>
<td>Ensure any raw material follows a strict qualification process</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>External quality certifications</th>
<th>Quality management system</th>
<th>Regulatory compliance as a top priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPTA IQPP for Source Plasma and QSEAL for manufacturing plants</td>
<td>Effective quality management system through all the organization from plasma collection centers to manufacturing facilities</td>
<td>None of Grifols sites involved in the plasma supply chain has received a warning letter, license suspension or revocation</td>
</tr>
</tbody>
</table>

---

Quality, Safety & Reliable Supply are Key Drivers of Sustainable Growth

A Core Value for Grifols

Regulatory Inspections 2016 - 1Q 2018 by Site

- USA: 11
- Spain: 17
- Ireland: 3

Regulatory Inspections 2016 - 1Q 2018 by Entity

- EMA: 16
- US FDA: 9
- Others*: 6

More than 30 inspections without critical observations

*Taiwan FDA, Health Canada DSE, CFDBI Chinese FDA, MoH of Rep. Kazakhstan, ANVISA Brazil, South Korea MFD, PPTA...
Recent Regulatory Achievements
Progress on Track

<table>
<thead>
<tr>
<th>2017 to Present</th>
<th>Ongoing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FDA manufacturing approvals</strong></td>
<td>• License submission of Prolastin® of European plasma for contract fractionation</td>
</tr>
<tr>
<td>• Filling line 3 (Albumin 20ml)</td>
<td>• License submission of Fraction IV₁ paste from Clayton for Prolastin®-C in BCN</td>
</tr>
<tr>
<td>• Filling line 5 (Prolastin®-C)</td>
<td>• 20% SCIG</td>
</tr>
<tr>
<td>• Approval to produce Gamunex® LA with II+III from Clayton</td>
<td>• Alphanate® new method in Clayton</td>
</tr>
<tr>
<td>• Approval of Gamunex® 2nd train in LA</td>
<td>• Albumin in bags</td>
</tr>
</tbody>
</table>

**Product approvals**

- Alpha-1 Liquid (FDA)
- Fibrin sealant (FDA and EMA)
- Rabies-C and GamaSTAN®-C (FDA)

Key Takeaways
Key Takeaways
Capacity Leadership to Optimize Growth

Manufacturing Capacities

• Global fractionation capacity to grow up to 19 million liters
• Key proteins purification and filling capacities growing aligned with global fractionation capacity
• Supporting future expansion by investing in land acquisitions, which will triple current surface
• An integrated supply chain that has become a competitive advantage
• Manufacturing reliability: stable product global supply

Manufacturing Efficiencies

• Continuous improvements in manufacturing performance translates to yields increase and manufacturing cost per liter containment
• Constant upgrades ensures state-of-the-art manufacturing operations
• U.S. and EU plants are able to work as alternate manufacturers among them
• Quality and safety are core values for Grifols to ensure sustainable growth and reliable supply
NAT Business: Capturing the Value of Vertical Integration
Remodeling and New Facilities Investments
San Diego, CA - Willow Court facilities  
Area: 41,900 sq ft
NAT Business: Capturing the Value of Vertical Integration
Remodeling and New Facilities Investments

New freezer in building 10808:
- Temperature: -20°C
- 268 pallet positions
- 3 levels
- 1 anteroom of 5°C

New warehouse in building 10808:
- Controlled temperature: 16-30°C
- 300 pallet positions
- 3 levels
NAT Business: Capturing the Value of Vertical Integration
Remodeling and New Facilities Investments

New building 10804:
- Ground floor: Q.C. and R&D labs (new R&D projects)
- 1st floor: offices

Acquisition of a new building 10895:
- 78,500 sq. ft approx.
- Template positive manufacturing (NAT related)
- Future expansion for IH manufacturing
- Warehouse space

Immunohematology Business: Investing to Support Growth
Key Growth Driver of Diagnostic Division

New fully automated machine for red cells manufacturing, with a nominal capacity of 3.5M vials/year to support business growth

25% increase in gel cards manufacturing capacity to underpin future growth
Hemostasis Business: Investing to Support Growth
Beckman Coulter Partnership to Drive Hemostasis Growth

New freeze-dryer with capacity of 1.5m vials/year

Capacity to manufacture up to 30 different hemostasis reagents

Blood Bag Business: New Manufacturing Plant in Brazil
Local Manufacturing Presence to Directly Serve the LATAM Market

Curitiba, Brazil

- Total: 5,525 m²
- Lot size: 15,176 m²
- Warehouse capacity: 1,270 pallets
- Initial manufacturing capacity: 8m units
- Possibility to duplicate capacity
- ANVISA inspection: 2Q 2018
- First commercial lots: 1Q 2019
Genotyping Business

FDA Regulatory Processes on Track

**Grifols Progenika, Bilbao**

- The company has obtained FDA approval for the genetic test for Alpha-1 deficiency
- The company successfully passed FDA plant inspection for ID Core XT manufacture, a key product in the blood genotyping IH portfolio
Antigens for Immunoassays

Ongoing Regulatory Submissions

Emeryville, California

• Already submitted to FDA:
  • HCR43
  • HB Core

• To be submitted in 2018:
  • C100
  • NS5
  • C22
  • C200

2018 Clinical Trials to Support Future Regulatory Submissions

<table>
<thead>
<tr>
<th>Immuno Hematology</th>
<th>U.S.</th>
<th>CE</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Eflexis</td>
<td>• New Gel Card Reader</td>
<td>• Eflexis</td>
</tr>
<tr>
<td></td>
<td>• 2 New Gel Cards</td>
<td>• XT Quality Control for molecular testing</td>
<td>• 2 New Cards</td>
</tr>
<tr>
<td></td>
<td>• New Quality Control (2 tubes)</td>
<td></td>
<td>• New Gel Card Reader</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hemostasis</th>
<th>U.S.</th>
<th>CE</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Instruments (Qsmart, JustQ, Qexpert)</td>
<td>• New Reagents:</td>
<td>• Eflexis</td>
</tr>
<tr>
<td></td>
<td>• All Reagents</td>
<td>• DG Latex VWF: Ag</td>
<td>• 2 New Cards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• DG APTT silica based</td>
<td>• New Gel Card Reader</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NAT</th>
<th>U.S.</th>
<th>CE</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Zika Organ and Tissue Transplant</td>
<td>• UE (Pool of 96 samples)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Babesia (Pooling)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Key Takeaways
Supporting Sustainable and Profitable Growth

- Continuous investments in core businesses in order to increase capacity
- Significant facilities investments in acquired NAT manufacturing and research activities in San Diego
- Sustained regulatory effort in genetic tests, new Emeryville antigens factory (Horizon Project), hemostasis products, immunohematology and NAT all support commercial opportunities for Grifols
Innovation
Driving Sustainable and Profitable Growth Through Strategic Innovation

David Bell
Chief Innovation Officer

Grifols Innovation Sites
Global Footprint

Approximately 1,000 Grifols employees are involved in R&D.
Over 100 additional researchers help drive Grifols' innovation strategy from within partnerships and investments coordinated through GIANT, headquartered in Ireland.
Sourcing Innovation Through Internal Capabilities, External Investment and Collaborative Ventures

- Multi-level, cross-functional evaluation of existing and emerging technologies
- Identification of strategically aligned opportunities
- Management alignment on strategy and risk
- Collaborative, multi-disciplinary approach
- Evaluation basis:
  - Strategic fit
  - Therapeutic need
  - Value potential/return
- Entering the digital age of healthcare

An open approach to identify, review, analyze and implement new opportunities

Grifols’ Strategic Approach to Growth Is Built on Sustainable Innovation

Executing a portfolio and pipeline that supports the core businesses

Investing in cutting edge and breakthrough approaches and platforms

- Enhance the scope and propriety use of albumin
- Molecular diagnosis
- New platforms for immune deficiencies, infectious diseases and other diseases/syndromes
- Novel ways of drug delivery - strategies to identify, deliver and monitor therapeutically sufficient dosing

Building internal R+D competencies to successfully compete tomorrow
An Integrated Innovation Approach
A Strategy That Transcends Internal Resources: Grifols Innovation Office

INTEGRATED STRATEGY

<table>
<thead>
<tr>
<th>BIOSCIENCE DIVISION</th>
<th>DIAGNOSTIC DIVISION</th>
<th>HOSPITAL DIVISION</th>
<th>EXTERNAL R+D+I</th>
</tr>
</thead>
<tbody>
<tr>
<td>New proteins and indications • Discovery of novel proteins with therapeutic uses and new indications for existing proteins</td>
<td>Instruments and reagents • New reagents and analyzers for transfusion medicine and specialized diagnostics</td>
<td>Hospital focus • Innovative solutions that help ensure hospital quality, safety and efficiency</td>
<td>GIANT Investments • Araclon • Alkahest • Aradigm • Singulex • Albajuna Therapeutics • GigaGen</td>
</tr>
<tr>
<td>Production methods</td>
<td>Systems and technologies • New systems and technologies that contribute to blood and plasma safety</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GRIFOLS ENGINEERING

GRIFOLS INNOVATION OFFICE

A Solid Commitment to an Integrated R+D+I Approach

(EUR in millions except for %)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal R+D+I</td>
<td>169</td>
<td>218</td>
<td>218</td>
<td>255</td>
</tr>
<tr>
<td>External R+D+I</td>
<td>30</td>
<td>56</td>
<td>77</td>
<td>56</td>
</tr>
<tr>
<td>% R+D+I on NR</td>
<td>5.9%</td>
<td>7.0%</td>
<td>7.3%</td>
<td>7.2%</td>
</tr>
</tbody>
</table>

GRIFOLS
Update on Internal R&D Projects

Recent Achievements

New Licenses Granted

- Liquid Alpha-1
- Fibrin Sealant
- Thrombin
- Rabies Hyperimmune - new formulation
- GamaSTAN® - new formulation
- Saline solution (new U.S. license granted)
- Alpha-1 genetic diagnostic test
- Product, automation and clinical testing services (5 new FDA licenses in 2018)

Expected Licenses (Short Term)

- Albumin in bags (expected in 2019)
- SCIG (expected in 2019)
- Low volume highly concentrated pdFVIII (expected in 2020)
- IVIG for Myasthenia Gravis - crisis (expected in 2020)
- Product, automation and clinical testing services (5 more FDA licenses expected in 2018)

A Solid Commitment to Collaborative Research

Albajuna Therapeutics

Development of a new treatment strategy based on antibodies with great potential to neutralize HIV

Alkahest

Research on age-related cognitive deterioration related to plasma proteins

Araclon Biotech

Research, treatment development and diagnostic tests for Alzheimer’s disease and other neurodegenerative diseases

Aradigm

Development and marketing of inhaled pharmaceuticals for the treatment and prevention of severe respiratory diseases.

GigaGen

Specialized in the development of novel innovative monoclonal and polyclonal antibody therapies

Singulex

Development of a novel ultrasensitive technology SMC™ (Simple Molecular Counting) applicable to clinical diagnostic and transfusional fields
The Human Proteome: Plasma Holds the Key to Disease Treatment
Emerging Technologies Based on Proven Platforms

Plasma reaches each and every organ; and each and every cell

Protein based treatment - plasma based and novel therapies (augmentation, inhibition and removal)

A key to new therapeutics

Next Generation Diagnostic Testing Solutions
A Comprehensive Approach to Each Business Line

<table>
<thead>
<tr>
<th>TRANSFUSION MEDICINE</th>
<th>CLINICAL DIAGNOSTICS</th>
<th>IMMUNO BUSINESS</th>
<th>INVEST IN DISRUPTIVE TECHNOLOGIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retain BDS Market Leadership Grow Immunohematology</td>
<td>Strengthen Hemostasis Explore Specialty Diagnostic</td>
<td>Expand recombinant protein development and production</td>
<td>Next generation sequencing Proteomics Point-of-care or near-patient instrumentation</td>
</tr>
<tr>
<td>• Menu expansion and high multiplexing assays</td>
<td>• Hemostasis: menu expansion and instrumentation</td>
<td>• Expand recombinant protein development and production</td>
<td>• Next generation sequencing</td>
</tr>
<tr>
<td>• Lab automation and software solutions</td>
<td>• Leverage expertise in medical diagnostic, infectious disease and antigen production to explore clinical diagnostic opportunities</td>
<td>• Grifols existing business</td>
<td>• Proteomics</td>
</tr>
<tr>
<td>• Value-added services for blood donor centers</td>
<td></td>
<td>• External partners</td>
<td>• Point-of-care or near-patient instrumentation</td>
</tr>
<tr>
<td>• Immunoassay serology testing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Adjacent synergistic product offerings</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Hospital Pharmacy

Increasing Efficiency & Economics of the Hospital Pharmacy through Quality & Safety

**Sterile IV Solutions**

- Needle-free bags for improved safety

**Pharmatech**

- IV workflow software that captures and digitizes data from connected devices on compounded IV preparations for analysis and actionable insights
- Robotics for automation in compounding for enhanced accuracy, safety and efficiency
- Closed System Transfer Devices that are compatible with oncology robots
- Smart pumps as connected devices to improve safety in administration
- Technology for precise identification of contents of IV solutions prior to final administration
- Automated eye tracking that will reduce contamination by enabling touchless data entry

Convergence of Science, Business and Society

Common Sense Solutions to Complex Challenges

**TOTAL DISEASE MANAGEMENT**

**TOWARD A PERSONALIZED MEDICAL EXPERIENCE**

- From earlier diagnoses of the onset of disease through new approaches to diagnostic testing and predictive analysis
- To developing therapies with plasma based proteins and their recombinant analogs
  - Delivered in novel ways to ensure bioactivity where it is actually required
- To monitoring the effect of treatment: identifying optimal dosing regimens
- To providing support and education to patients and their caregivers

Combining Grifols’ core competencies across divisions to deliver a new level of comprehensive care
Progenika Alpha-1 Genetic Test and Singulex
Driving Sustainable and Profitable Growth Using Core Capabilities in Diagnostic

Antonio Martínez
CEO, Progenika Biopharma

Progenika: A Grifols Company
An Integrated Innovation Strategy

- Founded in 2000 by a group of university and biotech-company researchers
- Leader in selected niches as transfusion medicine, cardiovascular and drug monitoring
- Located in Bizkaia (Spain), focused in R&D and manufacturing of IVD products
- Certified by EU, FDA, Health Canada, TGA (Australia), ANVISA (Brazil), SFDA (Saudi Arabia) and KFDA (Korea)
- 74 employees (40% PhDs in molecular biology)
Progenika: A Grifols Company
Capabilities in DNA Genotyping and Multiplexing

Progenika has broad expertise developing assays for the simultaneous detection of several DNA variants

Genetic Diagnosis of Alpha-1 Deficiency
Use of Core Capabilities in Diagnostic to Support Bioscience Growth
Alpha-1 Antitrypsin Deficiency
A Largely Undiagnosed Disease

- Alpha-1 antitrypsin deficiency is a genetic disease caused by mutations in the SERPINA1 gene.
- Although alpha-1 antitrypsin deficiency is not a rare disease (prevalence of 1:2,000 to 1:10,000 in EU and US), it is underdiagnosed.
- Diagnosis may take an average of 8 years following the onset of symptoms.
- Intravenous alpha-1 antitrypsin deficiency augmentation has been proven to be safe and effective in COPD patients.
- Diagnosis can be done through several techniques (alpha-1 antitrypsin deficiency levels, phenotyping or molecular biology) but all have important limitations.

Alpha-1 Antitrypsin Genetic Diagnosis
Grifols Developed a State-of-the-Art Test

- Universal method valid for worldwide population independently of geographical origin:
  - A1AT can detect the 14 most prevalent mutations worldwide.
  - Three sites - Lifeshare Blood Center (Louisiana, USA), University of Pavia (Pavia, Italy) and Progenika CLIA lab (San Marcos, U.S.) showed 100% correct calls in validation studies.
- Validated for non invasive samples: Samples can be saliva* or dry blood spot (DBS).
- First genetic test for A1AT diagnosis cleared by FDA and CE.

Grifols is actively contributing to improve the diagnosis rate of alpha-1 antitrypsin deficiency for an accurate clinical management of these patients.
**Alpha-1 Antitrypsin Genetic Diagnosis**

**Development of a Complete Solution: Kit**

1. **IVD Kits to be Processed in Hospitals or Reference Laboratories**

   Grifols supplies the kit and the laboratory runs the assay (i.e. Marburg University Hospital)

2. **Diagnostic Service through the Clinical Diagnostic Laboratory in Progenika**

   - **A** Collection kit delivered at Dr. office
   - **B** Patient sample collected at Dr. office
   - **C** Kit containing sample shipped to Progenika
   - **D** A1AT genotyping test at Progenika
   - **E** Customer report delivered to physician

   ![Diagram of diagnostic service process]
Key Takeaways
Use of Core Capabilities in Diagnostic to Support Bioscience Growth

- Grifols has developed the first genetic kit for the Alpha-1 antitrypsin deficiency approved by the FDA and CE
- The test is universal and the assay has been validated for non-invasive samples: buccal swabs and DBS
- Grifols is the only company that can offer a complete and worldwide solution for alpha-1 antitrypsin deficiency (kit and service)

Ultra-Sensitive Immunoassays in Blood Screening
Investing in Next Generation Serologic Testing
Singulex Ultrasensitive SMC™ Technology
Seeing the Invisible

- Company located in Alameda, CA
- Singulex has developed SMC™, Single Molecule Counting, a disruptive technology for protein identification and quantitation
- Grifols owns 20% and an exclusive license to apply the technology in blood and plasma donors

Singulex Ultrasensitive SMC™ Technology
Disease Onset and Progression Detection

- 75% of human proteins undetected due to low abundance *
- Remaining 25% includes proteins only detectable at disease levels

Singulex SMC™ technology makes it possible to measure new proteins and correlate their expression to disease onset/progression

* Source: Visiongain 2013 report; Singulex R&D
** Source: PubMed Citation search; Singulex R&D
Ultra-Sensitivity in Blood and Plasma Screening
Improves Safety and Diagnosis by Reducing the Window of Time After Infection

Detection in blood/plasma

Days after infection

HIV RNA (NAT)
HIV p24 Antigen (Immunoassay)
HIV Antibodies (Immunoassay)

SMC™ Sample Processing

Standard Immunoassay Steps
1. Analyte
2. Capture
3. Label
4. Elute / Concentrate
5. Quantify

SMC® Steps

Almost a standard immunoassay protocol but 50-1,000-fold higher over existing immunoassay products
**Grifols Ultra-Sensitive Immunoassays**

Project and Portfolio

- Assays for blood and plasma screening are currently in development (i.e. HIV, HCV, HBV, HTLV, etc.)
- Project is evolving as scheduled, with more than 90% of needed antigens and antibodies identified, most of them to be sourced from Grifols’ Emeryville facility
- Instrumentation for high-throughput screening is under development

---

**Key Takeaways**

Investing in Next Generation Serologic Testing

- SMC™ is the next generation of immunoassays as it allows precision measurement of biomarkers with unprecedented ultra sensitivity
- Grifols is developing the next generation of immunoassays and equipment based on SMC™ technology for blood and plasma testing
- Working with NAT and SMC™ is a step forward in Grifols ongoing efforts to improve safety in blood and plasma donors
GigaGen: Novel Polyclonal Antibody Therapeutics
Building the Future for the Treatment of Immune Diseases

Jose Terencio
Vice President, Innovation

GigaGen: Groundbreaking Technology
Capturing Natural Human Antibodies Repertoire

- In July 2017, Grifols acquired a 44% stake in GigaGen, a San Francisco-based biotechnology startup, for USD 35m to support new drug development
- GigaGen’s technology copies complete human antibody repertoires as DNA to develop novel polyclonal antibody therapies
- GigaGen’s technology has the potential to impact the treatment of certain immune and infectious diseases
- Potential new platform that can change the future of drug manufacture
GigaGen: Groundbreaking Technology
An Innovative Team With a Unique Patented Technology

- GigaGen was founded in 2011 by two Stanford scientists dedicated to combining immunology and genomics to combat diseases resulting from immune dysregulation
- The GigaGen team currently includes 17 people
- GigaGen has a strong IP position, with granted patents that protect both the construction of DNA libraries from donor blood cells as well as the expression of antibodies

David Johnson
Genomics
PhD Stanford

+ Everett Meyer
Immunology
MD/PhD Stanford
Stanford Professor

= World-leading technology
to understand and overcome immune dysregulation

GigaGen: Groundbreaking Technology
Antibodies: The Key to Immune Function

- Human antibodies are critical to proper immune function
- Antibodies are proteins made by B cells that allow healthy people to avoid or overcome disease
- Each B cell only makes 1 type of antibody
- Healthy people make millions of antibodies
- Heavy and light chain pairing determines antibody function
- Highly variable protein sequences ("heavy" and "light" chains) attack pathogens
- Heavy and light chains are encoded on separate chromosomes in a B cell, so capturing the DNA of natural heavy/light chain pairs entails first isolating a B cell

1. Type of white blood cell that makes antibodies. B cells are part of the immune system and develop from stem cells in the bone marrow. They are also known as B lymphocytes.
GigaGen: Groundbreaking Technology
Donor Blood Transformed Into a Library of Antibodies

GigaGen’s technology combines microfluidics, genomics, bioinformatics and protein expression to recreate all the antibodies encoded in the B cells of a donor sample.

- Blood sample from multiple donors
- Isolate single B cells in droplets
- Physically link antibody subunits
- Expression vectors are integrated in cell lines specifically designed to express antibodies
- Full-length secreted antibody library

The process is monitored with deep full-repertoire sequencing at each step.

GigaGen: A High Throughput Platform
Platform Processes 3,000,000 cells/hour

Exceptionally fast speed enables GigaGen to capture the full diversity of a human immune system.

- B cells
- Amplification mix
- Carrier oil
- DNA libraries
- Carrier oil

Level of magnification: 34: x100
Development of a True Polyclonal Hyperimmune

Validate Platform Using a Known Hyperimmune With Clear Biomarkers for Efficacy

- Find the best responders to the specific pathogen from the donor pool, clone their immune systems (B cells) and express as high titer recombinant hyperimmune antibodies

<table>
<thead>
<tr>
<th>Isolate millions of B cells</th>
<th>Create DNA library of antibodies</th>
<th>Express full antibody library in cell line</th>
</tr>
</thead>
</table>

- Pool many donors for B cell diversity
- Donors evidence high titers of target antibody

- Native pairing between heavy and light chains
- Library remains viable for future batches
- Over-represent antibodies against target pathogen

- Millions of natural human antibodies
- All relevant IgG subtypes

- GigaGen and Grifols are also collaborating on an innovative project to design a new cell line for specifically manufacturing of future polyclonal antibody libraries

Key Takeaways

Building the Future for the Treatment of Immune Diseases

- Grifols anticipates future collaborations on polyclonal therapies as we validate the expression, manufacturing, regulatory and clinical pathway with a unique polyclonal hyperimmune

- Continue to leverage Grifols’ experience in donor sample collection, sample processing, manufacturing, regulatory and clinical trial design to accelerate therapeutic development

- Grifols maintains exclusive rights to commercialize projects developed by GigaGen

- Provides a platform for responding to emerging viruses and infectious diseases that can be treated with neutralizing antibodies

- Grifols anticipates future investments in this cutting-edge technology with the aim to strengthen the treatment of infectious and immune diseases
## 2018 Investor and Analyst Meeting

Friday, June 8th

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Pick-up from hotels</td>
<td></td>
</tr>
<tr>
<td>8:30 - 8:45</td>
<td>Welcome</td>
<td></td>
</tr>
<tr>
<td>8:45 - 9:45</td>
<td>Innovation</td>
<td>David Bell</td>
</tr>
<tr>
<td></td>
<td>Research Studies on Albumin</td>
<td>Dr. Arroyo / Montserrat Costa</td>
</tr>
<tr>
<td>9:45 - 11:15</td>
<td>Product Showroom</td>
<td>Carlos Roura / Daniel Fleta</td>
</tr>
<tr>
<td>11:15 - 12:00</td>
<td>Financials</td>
<td>Alfredo Arroyo</td>
</tr>
<tr>
<td>12:00 - 12:15</td>
<td>Closing</td>
<td>Victor Grifols Deu</td>
</tr>
<tr>
<td>12:15 - 12:45</td>
<td>Q&amp;A</td>
<td></td>
</tr>
<tr>
<td>12:45 - 1:30</td>
<td>Lunch</td>
<td></td>
</tr>
</tbody>
</table>
Alzheimer’s Management By Albumin Replacement

Prequel to Results

• AMBAR is a double-blind, placebo-controlled trial with 400+ individual patients with mild to moderate Alzheimer’s disease, studied over a year of treatment with a combination of low volume plasma exchange and albumin replacement

• Trial endpoints:
  o Primary: combination of cognition (ADAS-Cog) with activities of daily living (ADCS-ADL) at 14 months of treatment
  o Secondary: combination of cognition (ADAS-Cog) with activities of daily living (ADCS-ADL) at intermediate points, other variables of function and cognition at intermediate points. Amyloid Beta and P-TAU in Plasma and CSF
  o Other endpoint of interest: MMSE (Mini-mental status examination)
Alzheimer’s Management By Albumin Replacement
Prequel to Results

- Data to be analyzed:
  - Test results
  - Laboratory samples
  - Cognitive analysis

- Follow-up analysis, additional clinical trials and possible clinical implementation:
  - Genomic analysis of high responders
  - Other work and analysis as suggested by data

- In partnership with key opinion leaders and clinicians treating Alzheimer’s patients

- Data lock: June 2018; Clinical study report (CSR): 1Q 2019; Topline data presentation 4Q 2018

Research Studies on Albumin

Montserrat Costa, PhD
Dr. Arroyo, MD, PhD
Driving the Discovery and Delivery of Albumin’s Untapped Potential

Montserrat Costa, PhD
Senior Manager, Research

Albumin Molecule

- Highly soluble protein with only one chain of 585 amino acids and lacking added sugars (molecular weight= 66,500 Daltons).

- Synthesized in the liver at the rate of 12 - 25 g/day

- Most abundant protein (more than 50% of the plasma and CSF proteins by mass)

- Distribution within the body:
  - Intravascular: 40% of total albumin
  - Extravascular (intracellular + interstitial): 60% alb

CSF: Cerebrospinal fluid
First modern use took place during WWII as a plasma substitute

Albumin infusion is a safe and effective fluid replacement for conditions requiring plasma volume expansion

Low blood volume with or without shock, trauma, major surgeries, cardiopulmonary bypass procedures, Therapeutic Plasma Exchange

Albumin Molecule
Albumin Has Multiple Properties

- Most abundant protein
- Maintains intravascular volume
- Main antioxidant
- Main transporter (fatty acids, drugs, metabolites, metals)
- Immunomodulatory effects
Albumin Molecule

Does Albumin Dysfunction Matter?

**Albumin Molecule**

**Albumin in Health and Disease**

**HEALTH**

**DISEASE**

- Oxidation
- Glycation
- Post translational modifications

---

**Association between albumin functional capacity and survival in liver diseases**

*Altered in the Functional Capacity of Albumin in Patients with Decompensated Cirrhosis Is Associated with Increased Mortality*

Raj Jalan, Susannah Schwartz, Rajeshwar P. Mukherjee, Sandro Ina, Lisa Cleland, Stephen Ridge, Vladimir Kozlovsky, Roger Williams, Carri Mathies/ and Nathan A. Davies

*HEPATOLOGY, Vol. 50, No. 2, 2009*

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*Oxidative albumin damage in chronic liver failure: Relation to albumin binding capacity, liver dysfunction and survival*

Karl Oettl, Ruth Birner-Gruenberger, Walter Spindelböck, Hans Peter Stueger, Livia Dorn, Vanessa Stadlbauer, Csilla Putz-Bankuti, Peter Krässig, Ivo Graziaeder, Wolfgang Vogel, Carolin Lackner, and Georg E. Stauber

*Journal of Hepatology, 2013, Vol. 59: 978-983*

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*Immunomodulatory and antioxidant function of albumin stabilises the endothelium and improves survival in a rodent model of chronic liver failure*

Rita Garcia-Martinez, Fausto Andrea, Gautam Mehta, Katie Poulton, Marc Orts, Maria Jover, Junpei Itoha, Jane Mcnaghten, Francesco De Chiar, Abeba Habtesion, Rajeshwar P. Mukherjee, Nathan Davies, Rajiv Jalan

*Journal of Hepatology, 2015, Vol. 62: 799-806*
Albumin Molecule

Does Albumin Dysfunction Matter?

Association between albumin functional capacity and survival in liver diseases

TARGET:

effective albumin concentration (Sufficient + Functional)

Albumin Use

Rationale

Discovery | 2000 | 2016
---|---|---
Albumin as a plasma substitute | Albumin is not just a plasma volume expander | Albumin functional alterations in disease / aging | Albumin dysfunction matters | Albumin is a pharmaceutical active ingredient
Grifols Albumin Research Approach

Grifols Research on Albumin

ALBUMIN AS A PHARMACEUTICAL ACTIVE INGREDIENT

NON CLINICAL PROGRAM

CLINICAL PROGRAM

Albumin Characterization & Mechanisms of Action (MoAs)
Current Albumin Clinical Programs

<table>
<thead>
<tr>
<th>AMBAR</th>
<th>PRECiosa</th>
<th>APACHE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer’s disease</td>
<td>Cirrhosis</td>
<td>Acute-on-chronic liver failure</td>
</tr>
<tr>
<td>PE-A5%</td>
<td>Albumin infusion</td>
<td>PE-A5%</td>
</tr>
</tbody>
</table>

Non clinical research program for the understanding of albumin effects & MoAs

PE-A5%: Plasma Exchange with 5% Albumin reposition

Alzheimer’s Disease
**Rationale**

**Alzheimer’s Disease (AD)**

- Prevalence ↑
- No treatments approved in 15 years
- Phase III targeting Aβ fail
- AD is a systemic disease that needs a multi-target approach
- Albumin is more than a plasma volume expander

---

**AMBAR (Alzheimer Management By Albumin Replacement)**

**Over a Decade of Alzheimer Related Research**

Combination of therapeutic plasma exchange and replacement of albumin to stabilize Alzheimer’s disease

- REPLACEMENT: “New” albumin providing antioxidant and binding capacity.
- “MECHANICAL” REMOVAL: Toxic amyloid proteins, Other known and unknown pathological substances.
AMBAR Program

Overview

**Clinical**

- **2004**
  - **Pilot**: Feasibility of PE with therapeutic albumin in mild to moderate AD

- **2007**
  - **Pilot Extension**: Reproducibility of pilot study results

- **2009**
  - **Phase II**: Confirmation of pilot results in a larger, randomized, controlled study

- **2012**
  - **Phase II/III**: AMBAR Trial: assess efficacy/safety of the approach in a randomized MCT
    - Database lock in June 2018

**Non Clinical**

- **2007**
  - **Research on PE and Albumin**: Non clinical support for Grifols’ therapeutic products in AD

- **2008**
  - **Research on PE and Albumin**: Albumin as a Pharmaceutical Active Ingredient in AD

- **2018**
  - **PLANNED**: Confirmatory and new studies to support AD treatment based on PE-A5%

**WHAT CAN WE LEARN FROM THE PHASE II TRIAL?**

Is albumin altered in Alzheimer patients? vs. Healthy controls vs. AD patients at baseline
**Albumin Oxidation in Plasma and CSF**

**Albumin Oxidation**

Albumin is more oxidized in AD than healthy controls, especially in CSF.

- **CSF**: Cerebrospinal fluid
- Represented values: Median

**Antioxidant capacity**

Costa et al. JAD 2018; DOI 10.3233/JAD-180243

<table>
<thead>
<tr>
<th></th>
<th>Plasma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>65%</td>
</tr>
<tr>
<td>AD</td>
<td>54%</td>
</tr>
</tbody>
</table>
**Albumin Oxidation**

Albumin Is More Oxidized in AD Than Healthy Controls, Especially in CSF

Plasma

<table>
<thead>
<tr>
<th>Healthy</th>
<th>AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>65%</td>
<td>54%</td>
</tr>
<tr>
<td>33%</td>
<td>43%</td>
</tr>
</tbody>
</table>

Antioxidant capacity

+ + + +

Reduced
Reversibly oxidized
Irreversibly oxidized

Costa et al. JAD 2018; DOI 10.3233/JAD-180243

CSF: Cerebrospinal fluid
Represented values: Median
Albumin Oxidation

Albumin Is More Oxidized in AD Than Healthy Controls, Especially in CSF

Antioxidant capacity

Costa et al. JAD 2018; DOI 10.3233/JAD-180243

CSF: Cerebrospinal fluid
Represented values: Median

GRIFOLS
Albumin Oxidation

Albumin Is More Oxidized in AD Than Healthy Controls, Especially in CSF

Albumin Glycation in Plasma

Glycation is an spontaneous age-dependent modification linked to AD
Albumin Glycation
Plasma Albumin Is More Glycated in AD Than Healthy Controls

Glycated albumin (%)

<table>
<thead>
<tr>
<th>Healthy controls (n=31)</th>
<th>AD baseline (n=34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median ± Interquartile range (min. to max.)</td>
<td>Median ± Interquartile range (min. to max.)</td>
</tr>
<tr>
<td>20% ± 5%</td>
<td>25% ± 10%</td>
</tr>
</tbody>
</table>

Non-diabetic range

Median ± Interquartile range (min. to max.)
Mann-Whitney test
*** P<0.001, changes between AD Baseline and Healthy Controls

Albumin in plasma of AD patients is not only more oxidized but more glycated than age-matched healthy controls

WHAT CAN WE LEARN FROM THE PHASE II TRIAL?

Is albumin altered in Alzheimer patients? YES
Which are the effects of the treatment with PE-A5%?
WHAT CAN WE LEARN FROM THE PHASE II TRIAL?

Which are the effects of the treatment with PE-A5%?

What are the effects of treatment with PE-A5%?

- CSF Aβ42 levels improve in treated patients
- CSF albumin antioxidant capacity shows a similar trend of improvement in treated patients
- PE-A5% shows a positive but transient effect in lowering albumin glycation
Plasma exchange

Albumin as a pharmaceutical active ingredient in AD

- Albumin in AD has reduced antioxidant capacity and is more glycated
- CSF albumin oxidation in AD warrants further assessment as biomarker and therapeutic target
- PE-A5% shows Aβ mobilization and albumin glycation improvement

Cirrhosis
Cirrhosis

Compensated
- Minor/absent symptoms
- Liver lesions progress
- Ascites

Decompensated
- Variceal bleeding
- HE & Bacterial infection
- Short survival (3-5y)
- Ascites

PRECIOSA

HE: Hepatic Encephalopathy

Preciosa - IG 1601

Prevention of mortality with long-term administration of human albumin in subjects with decompensated cirrhosis and ascites
**Albumin Infusion**

**Rationale**

- **ALBUTEIN®**

**INFUSION:**
- New albumin providing antioxidant and binding capacity

---

**Preciosa**

**Program Overview**

<table>
<thead>
<tr>
<th>Year</th>
<th>Clinical</th>
<th>Non-Clinical</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>Pilot</td>
<td>Research on Albumin as Pharmaceutical Active Ingredient in Cirrhosis</td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>Phase III</td>
<td>PLANNED: confirmatory studies to support cirrhosis treatment based on albumin infusions</td>
</tr>
<tr>
<td>2022</td>
<td>FDA approved IND</td>
<td></td>
</tr>
</tbody>
</table>

**MCT:** Multicentric Clinical Trial  
**IND:** Investigational New Drug application
WHAT CAN WE LEARN FROM THE PILOT TRIAL?

Cirrhotic patients vs. healthy controls

Is albumin altered in cirrhotic patients?

YES

What are the effects of albumin infusion?

BSII: Binding site II
WHAT CAN WE LEARN FROM THE PILOT TRIAL?

What are the effects of albumin infusion?

BSII: Binding site II
**Pilot**

Research on Albumin

---

**Phase III**

---

**Albumin as a pharmaceutical active ingredient in cirrhosis**

- Cirrhotic patients show reduced content of albumin with antioxidant and binding capacity
- Albumin infusion tends to improve these capacities

---

**Cirrhosis**

- **Compensated**
  - Long (>10y)
  - Minor/absent symptoms
  - Liver lesions progress
- **Decompensated**
  - Ascites
  - Variceal bleeding
  - HE & Bacterial infection
  - Short survival (3-5y)
  - Precipitating event

---

**Progression of liver failure to multi organ failure**

- Acute-on-Chronic Liver Failure

---

**APACHE**

**ALADDIN**

---

HE: Hepatic Encephalopathy
Apache - IG 1407

Effects of plasma exchange with human serum albumin 5% (PE-A5%) on short-term survival in subjects with “Acute-On-Chronic Liver Failure” (ACLF) at high risk of hospital mortality

Plasma Exchange + Albumin

Rationale

- New albumin providing antioxidant and binding capacity
- Damaged albumin
- Other known and unknown pathological substances
## Apache

### Program Overview

<table>
<thead>
<tr>
<th>Year</th>
<th>Clinical Study</th>
<th>Non-Clinical Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>Pilot</td>
<td>Research on PE and Albumin as Pharmaceutical Active Ingredient in ACLF</td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>Phase III</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>Phase III</td>
<td>ALADDIN Study</td>
</tr>
<tr>
<td>2022</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**APACHE Trial**: assess 90-day survival in a randomized MCT

**FDA approved IND**

---

### WHAT CAN WE LEARN FROM THE PILOT TRIAL?

ACL patients vs. healthy controls

- Is albumin altered in ACLF patients? **YES**
- Albumin concentration
- Albumin anti-oxidant capacity
- Albumin binding capacity to BSII
- Albumin fatty acid binding capacity

**PE-A5%**: Plasma Exchange with 5% Albumin reposition

**MCT**: Multicentric Clinical Trial

**IND**: Investigational New Drug application

---

**2018 Investor and Analyst Meeting | Barcelona**
WHAT CAN WE LEARN FROM THE PILOT TRIAL?

Is albumin altered in ACLF patients? YES

What are the effects of the PE-A5%?
WHAT CAN WE LEARN FROM THE PILOT TRIAL?

What are the effects of the PE-A5%?

- Albumin concentration
- Albumin antioxidant capacity
- Albumin binding capacity to BSII
- Albumin fatty acid binding capacity

Plasma exchange

- Albumin in ACLF shows reduced antioxidant capacity, albumin binding capacity, and fatty acid binding capacity
- Treatment improves albumin functional capacities

Albumin as a pharmaceutical active ingredient in ACLF
The Aladdin Study
A Translational Research Project

The ALADDIN study is a UNIQUE opportunity to investigate in ACLF:

- Mechanisms of the pathology
- Mechanisms of action of plasma exchange (PE) using albumin as a replacement fluid
- Beneficial biological effects of albumin unrelated to plasma volume expansion

Research based on state-of-the-art, high throughput techniques and expert groups collaboration

- Albumin functional characterisation
- Inflammation
- Omic studies
Key Takeaways

Albumin is not just a plasma volume expander
Albumin functional alterations in disease / aging
Albumin dysfunction matters
Albumin is a pharmaceutical active ingredient
**Key Takeaways**

Albumin is not just a plasma volume expander. Albumin functional alterations in disease/aging matter. Albumin is a pharmaceutical active ingredient.

**Discovery**
- Albumin as a plasma substitute
- Albumin is altered in chronic liver disease and in Alzheimer’s disease

**2000**
- Albumin infusion shows clinical improvement and functional enhancement of albumin in liver cirrhosis

**2016**
- Albumin dysfunction matters
- Plasma exchange with albumin replacement shows clinical benefit and albumin functional improvement in Alzheimer’s disease and ACLF

Grifols drives the discovery and delivery of albumin’s untapped potential.

---

**Albumin as a Drug**

Dr. Arroyo, MD, PhD  
President of the European Foundation for the Study of Chronic Liver Failure
Past, present and future of the relationship between a relevant human disease, hepatic cirrhosis, and an octogenarian pharmacologic molecule, human serum albumin (1940-2018 and beyond).

THE PAST

Jesus Christ only cured three sick men: a blind man, a leper and a cirrhotic patient with ascites.

Mosaic 12th-13th Century
Cathedral of the Assumption
Monreale, Sicily
Paracentesis was the only effective treatment of ascites since the time of Galeno (123 A.C) until the 1950s, when modern diuretics and diuretic therapies were introduced.
Five consecutive randomized controlled trials (1987-1993) showed paracentesis to be a rapid, effective and safe therapy of ascites in cirrhosis if performed with small trochars, under sterile conditions and **using i.v. albumin** (8 g/L of ascitic fluid removed, **80 g per treatment**)

**Creatinine (mg/dL)**

<table>
<thead>
<tr>
<th>Weeks</th>
<th>-4</th>
<th>-2</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Hepatorenal Syndrome**

- Cefotaxime
- Paracentesis + albumin
- Encephalopathy
- Jaundice

**Type-1 HRS**

[Graph showing changes in creatinine over weeks and months.]
### Treatment of Spontaneous Bacterial Peritonitis with Albumin

(1.5 g/kg at diagnosis and 1g/kg at the 3rd day, **150 g per treatment**)

**The second indication of albumin in cirrhosis**

<table>
<thead>
<tr>
<th></th>
<th>Cefotaxime (n=63)</th>
<th>Cefotaxime + Albumin (n=63)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resolution of infection</strong></td>
<td>57 (93%)</td>
<td>59 (98%)</td>
</tr>
<tr>
<td><strong>HR</strong></td>
<td>20 (32%)</td>
<td>6 (10%)*</td>
</tr>
<tr>
<td><strong>Hospital mortality</strong></td>
<td>17 (27%)</td>
<td>6 (10%)*</td>
</tr>
</tbody>
</table>

**HRS:** Hepatorenal syndrome; *p<0.001

---

**First study on the treatment of Hepatorenal Syndrome (HRS) with Terlipressin and Albumin** (20-40 gr day, **300 g per treatment**)

**The third indication of albumin in cirrhosis**

**TREATMENT OF TYPE-1 HRS WITH TERLIPRESSIN PLUS I.V. ALBUMIN vs TERLIPRESSIN**

<table>
<thead>
<tr>
<th></th>
<th>Terlipressin + albumin (n=13)</th>
<th>Terlipressin (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Complete response</strong></td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td><strong>Survival &gt;1 month</strong></td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td><strong>OLT</strong></td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

**OLT:** Orthotopic liver transplantation

*Sort et al, New Engl J Med 1999*

*Ortega et al., Hepatology 2002*
**THE PRESENT**

**It is framed by two important facts:**

1. The identification and characterization of a new syndrome, Acute on Chronic Liver Failure (ACLF), in cirrhosis (2002-2013)
2. Grifols’ decision to promote an ambitious long-term research program on the mechanism of ACLF, albumin’s potential role in preventing and treating this syndrome and new mechanisms of action of albumin in cirrhosis.

---

**A patient with ACLF.**

**Major characteristics of the syndrome**

52 year old man with cirrhosis. Previous history of ascites. Actively working as civil engineer. Admitted to hospital with pneumonia and rapid deterioration of his clinical condition. On admission ascites, deep jaundice, grade III hepatic encephalopathy and renal failure. The patient was admitted to the ICU but died 4 days later with progressive impairment of liver, renal, and cerebral function. **(High risk of Short-Term Mortality)**
The European Foundation for the Study of Chronic Liver Failure (EF Clif). A joint venture between European investigators, Grifols and the EASL

European Foundation for the Study of Chronic Liver Failure (EF Clif)

Translational Research: The Grifols Chair
Clinical Research: The EASL* Chair

European Network of laboratories for Translational Research on CLIF (ENTR-CLIF)
EASL*-CLIF Consortium

*EASL: European Association for the Study of the Liver

100 European University Hospitals Associated With the EASL-CLIF Consortium in 2017
Main results of the CANONIC study, the first EF Clif investigation aimed at characterizing the ACLF syndrome

1. Prevalence of ACLF: **415/1343**: (32%)
2. Grade of severity (prevalence): ACLF-1: 51%; ACLF-2: 35%; ACLF-3: 14%.
3. Age: 56 years
4. Etiology of cirrhosis: alcoholic 56%, hepatitis C 15%, alcohol + hepatitis C 9%.
5. Time from first decompensation: no prior decompensation 26.5%; <3 months 15.5%.
6. Precipitating events: bacterial infections 31%, acute alcoholic liver injury 23%, no identifiable precipitating event (45.6%).
7. Main cause of death. **40% of patients with cirrhosis die as a consequence of ACLF.**

Prevalence of ACLF in Europe (CANONIC Study)
Prevalence of ACLF in Asia

Prevalence of ACLF in the U.S.
ACLF Mortality Rate Is Strongly Related with the Number of Organ Failures (CANONIC Study)

Inflammatory Markers and ACLF
ACLF Occurs in the Setting of a Severe Systemic Inflammation (Canonic Study)
It will be largely influenced by research programs led by Grifols and EF Clif.

**Research Programs to Improve the Management of Cirrhosis Patients**

**Grifols’** research program aims to discover new therapies with albumin to prevent and treat ACLF (2015)

**The APACHE and the PRECiosa studies**

**EF Clif’s** translational research program “**Albumin as a Drug**” to identify new mechanisms of action of albumin (2016)
Plasma Exchange (PE) May Improve Survival in Patients With ACLF
(The APACHE Pilot Study)

**Clinical**
- **Pilot**
  - Effect of plasma exchange (PE) with 5% on standard clinical and laboratory data and survival in 10 patients with ACLF.

**Non-Clinical**
- **Research on PE and Albumin as bioactive molecule in ACLF**
- **ALADDIN Study**. Attached mechanistic study in 150 patients included in the APACHE trial

**APACHE Program Overview**

- **2010**
- **2014**
  - Pilot
  - Effect of plasma exchange (PE) with 5% on standard clinical and laboratory data and survival in 10 patients with ACLF.

- **2015**
- **2022**
  - Phase III
  - APACHE Trial: assess 90-day survival in a RMCT (380 patients with ACLF) comparing PE (6 sessions) with SMT.
  - FDA approved IND

**PE-A5%**: Plasma Exchange with 5% Albumin reposition (600 g per treatment)
**RMCT**: Randomized Multicentric Clinical Trial
**SMT**: Standard Medical Therapy
**IND**: Investigational New Drug application

**Graph**
- **Patients treated with PE**
  - Probability of survival: 68%
- **Untreated group**
  - Probability of survival: 40%
**Initial Data: Albumin Dosage Is Important for Therapeutic Response**
(The PRECIOSA Pilot Study)

Low dose: 1 g/Kg every 2 weeks
High dose: 1.5 g/Kg every week
Long-Term Albumin in Cirrhosis: Is It the ANSWER?

ANSWER STUDY: Italian MC-RCT Assessing Long-Term (18-month) Albumin Treatment in Cirrhotic Patients With Ascites

431 PATIENTS

SMT+ HA
213 patients

SMT
216 patients

SMT: STANDARD MEDICAL THERAPY
HA: HUMAN ALBUMIN (40 g/WEEK, 2.3 Kg/year)

Caraceni P. et al. Lancet 2018
**ANSWER Study: Impact of Long-Term Albumin Treatment on Clinical Course**

<table>
<thead>
<tr>
<th>Event</th>
<th>Percent reduction (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascites development</td>
<td>52 (36-65)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Refractory ascites</td>
<td>57 (38-71)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>SBP</td>
<td>37 (50-81)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Other infections</td>
<td>30 (10-46)</td>
<td>&lt;0.005</td>
</tr>
<tr>
<td>Encephalopathy</td>
<td>52 (37-63)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Renal dysfunction</td>
<td>50 (36-61)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Type-1 HRS</td>
<td>61 (24-81)</td>
<td>&lt;0.004</td>
</tr>
</tbody>
</table>

*Percent reduction of the events in the albumin treated group versus the control group.*

**ANSWER STUDY: Impact of Long-Term Albumin Treatment on Survival**

Overall survival

- **P=0.0285**
Research Programs to Improve the Management of Cirrhotic Patients

**Grifols**’ research program to design new therapies with albumin for the prevention and treatment of ACLF (2015)
The APACHE and PRECIOSA studies

EF Clif’s translational research program “**Albumin as a Drug**” to identify new mechanisms of action of albumin (2016)

**“Albumin as a Drug” Program**
Acute decompensation and ACLF occur in the setting of severe systemic inflammation (very high levels of inflammatory cytokines)
(The CANONIC Study)

<table>
<thead>
<tr>
<th>INFLAMMATION</th>
<th>Healthy Subjects (40)</th>
<th>Patients with decompensated cirrhosis No ACLF(342)</th>
<th>ACLF (180)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNFα</td>
<td>9 (7-12)</td>
<td>20 (14-27)≡</td>
<td>29 (17-41)**</td>
</tr>
<tr>
<td>IL-6</td>
<td>0.3 (0.3-0.3)</td>
<td>21 (14-41)≡</td>
<td>39 (17-115)**</td>
</tr>
<tr>
<td>IL-8</td>
<td>1.6 (0.6-3.3)</td>
<td>37 (20-76)≡</td>
<td>84 (41-169)**</td>
</tr>
<tr>
<td>MIP-1β</td>
<td>13 (6-17)</td>
<td>20 (13-34)≡</td>
<td>28 (19-50)**</td>
</tr>
<tr>
<td>G-CSF</td>
<td>2.1 (1.8-11)</td>
<td>23 (11-50)≡</td>
<td>32 (14-83)**</td>
</tr>
<tr>
<td>GM-CSF</td>
<td>1.7 (1.7-1.7)</td>
<td>4.5 (2-9.5)≡</td>
<td>7.3 (2.1-30)**</td>
</tr>
</tbody>
</table>

≡ p<0.001 vs healthy Subjects; **p<0.0001 vs No ACLF.

Claria J et al, Hepatology 2017
“Albumin as a Drug” Program
High long-term Albumin dose markedly reduces plasma cytokine levels in decompensated cirrhosis (The PRECIOSA Pilot Study)

- Low albumin dose
  (1 g/kg every 2 weeks for 12 weeks)

- High albumin dose
  (1.5 g/kg every week, for 12 weeks)

% change over pre-treatment values in the two groups

Albumin prevents the increased release of cytokines by monocytes and PMN stimulated with CpG

**Monocytes**

- **IL-1β**
  - Low dose:
    - Cpg: 10, 15
  - High dose:
    - Cpg: 10, 15

- **IL-6**
  - Low dose:
    - Cpg: 10, 15
  - High dose:
    - Cpg: 10, 15

- **TNFα**
  - Low dose:
    - Cpg: 10, 15
  - High dose:
    - Cpg: 10, 15

**PMN**

- **IL-1β**
  - Low dose:
    - Cpg: 10, 15
  - High dose:
    - Cpg: 10, 15

- **IL-6**
  - Low dose:
    - Cpg: 10, 15
  - High dose:
    - Cpg: 10, 15

- **TNFα**
  - Low dose:
    - Cpg: 10, 15
  - High dose:
    - Cpg: 10, 15

PMN: Polymorphonuclear cells
“Albumin as a drug” Program
In vitro experiments performed with bacterial DNA (CpG), which
activates inflammation by interacting with intracellular
endosomal TL receptors\(^1\) in immune cells

Klinman DM et al. Nature 2004
\(^1\) TL receptors = Toll-like receptors

Albumin internalization inside cells of the immune system

Hypothesis: Monocytes internalize HSA during endosome formation which immune
modulates the inflammatory response at intracellular level

HSA-FITC

Monocytes

Cell Fixation and Permeabilization

Anti-endosome antibody

Confocal microscopy
Albumin is detected inside the monocytes

Nuclei: DAPI (blue); Albumin: FITC (green); Early endosomes: EEA1 (Red)

Albumin co-localizes with endosomes in monocytes

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>10’</td>
<td>60’</td>
<td>120’</td>
<td></td>
</tr>
</tbody>
</table>
Key Takeaways

1. ACLF syndrome is extremely common in patients with cirrhosis.

2. ACLF occurs in the setting of severe systemic inflammation that impairs cardio-circulatory function, produces multi-organ failure and leads to very high mortality rate (leading cause of mortality in cirrhosis).

3. Albumin is a powerful immune-modulator that markedly reduces the circulating levels of inflammatory mediators in cirrhosis.

4. Pilot PRECIOSA and APACHE studies suggest that Albumin prevents ACLF in patients with cirrhosis and improves cardio-circulatory, liver, renal and brain functions and survival in cirrhosis and ACLF. Two confirmatory Phase 3 clinical trials sponsored by Grifols, will start in September 2018 and in 2019.

Continue research efforts on albumin!
2018 Investor and Analyst Meeting

Barcelona
7th and 8th June

Product Showroom

Carlos Roura and Daniel Fleta
Chief Industrial Officer / Deputy Chief Industrial Officer
**Hospital Medication Workflow**

Grifols’ Technologies Allow to Control More than the 80% of the Medication Workflow

---

**Compounding**

The Most Comprehensive Portfolio of Consultancy, Software, Equipment, Disposables and Services to Manage the IV Compounding Workflow

Improving Safety, Quality and Efficiency
**Misterium®**

**Modular Cleanroom Systems**

- Grifols’ sterile manufacturing expertise applied to the compounding pharmacy
- High quality modular cleanrooms that can be configured to fit any space and location
- **Benefits:**
  - Easy installation and maintenance
  - Versatile
  - Helps regulatory compliance
- **Misterium®** was designed in Chile and launched in the year 2000. Nowadays, it has been installed in more than 400 sites worldwide
- Extending the Grifols Engineering knowledge on environmental control to Hospital Pharmacy

---

**PhocusRx®**

**Grifols’ Sterile Manufacturing Expertise Applied to the Compounding Pharmacy**

- Non-invasive IV workflow management system providing safe, reliable and easy to use solution for remote validation and documentation of the manual compounding processes
- **Benefits:**
  - Improves pharmacy management
  - Improves patient safety
  - Reduces environmental risk
  - Helps regulatory compliance
- **PhocusRx®** was launched in 2008
- After the MedKeeper acquisition, its software component will be merged with the PharmacyKeeper software and still using PhocusRx® hardware
Gri-fill® 4.0
Unique Semi-Automated Compounding System

- The unique semi-automated compounding system that guaranties the sterility of final product preparations
- Benefits:
  - Guaranties the sterility of final preparations
  - Improves pharmacy management
  - Improves patient safety
  - Improves operator safety (Oncology drugs)
  - Provides efficiency and ease of to use
  - Helps regulatory compliance
- Gri-fill® was launched in 1992

Kiro® Oncology
Fully Automated Compounding System for Oncology and Biological Drug Preparations

- Improve patient safety
  - Accuracy
  - Verification and traceability
  - Aseptic compounding and quality assurance
- Improves operator safety
  - Closed system
  - Self cleaning
  - Disposal of hazardous residues
- Improves pharmacy management
  - Economy
  - Flexibility
  - Efficiency
  - Connectivity
- Helps regulatory compliance
- Kiro® Oncology was launched in Europe in 2013 and in the U.S. in 2015
**Kiro Fill®**
High Efficiency Fully Automated Compounding System for Non-hazardous Drugs

- **Benefits:**
  - Improves pharmacy management
  - Delivers high-throughput
  - Offers flexibility and configurability for optimal productivity
  - Provides identification and traceability of processes and preparations
  - Helps regulatory compliance

- Kiro Fill® is expected to be launched in Europe and U.S. during 2019

---

**PharmacyKeeper**
Web and Mobile-Based Applications to Improve Key Pharmacy Operational Processes

- **Benefits:**
  - Provides visibility into critical pharmacy operations
  - Delivers real-time reporting and analytics
  - Fits existing workflows
  - Helps regulatory compliance

- PharmacyKeeper was launched in the U.S. in 2013
**IV Fluids: IV Solution**

0.9% Sodium Chloride Injection, USP, in Fleboflex® Plastic Container 500 mL.

- Non-PVC, non-DEHP and non-latex flexible container
- The solution is only in contact with polypropylene, highly compatible material
- Designed for a safe and easy handling: rounded upper and lower corners and integrated eyelet support.
- High sealing resistance to pressure cuffs responding satisfactorily to 400 mmHg pressure for 72 hours
- Totally collapsible, lightweight and transparent
- Safe attachment of the infusion set thanks to the outlet port internal membrane
- No parts of the cover have to be removed to access the outlet port

---

**IV Fluids: Fleboflex® Luer**

Efficacy and Safety in the Preparation of Mixtures in the Hospital Pharmacy

- Non-PVC, non-DEHP and non-latex flexible container
- Rapid addition of medication and solution extraction from the Fleboflex® Luer bag using a needle-free syringe, eliminating the risk of accidental punctures
- A vial adapter can be connected for reconstitution
- No dripping when connecting and disconnecting the syringe and vial adapter
- Large additive volume: only partially filled bag with luer lock connection in the Spanish market
Silicon
Modular Software System for Electronic Prescription Order Entry

- Central pharmacy
  - Prescription validation
  - Inventory management
- Nursing Units
  - Medication prescription
  - Medication administration record (eMar)
- Outpatients
  - Day hospital management
  - Ambulatory and home care patients management
- Benefits:
  - Increases safety in the use of the medication
  - Offers specific designs for physicians, nurses and pharmacists
  - Offers configurability and modularity

The first version of Silicon was launched in 2001. Grifols has been providing Pharmacy Information Systems since 1983.
**BlisPack®: System for Automatically Identification, Cut & Overwrap Blister Sheets to Produce Medication in Unit Dose Format**

- **Benefits:**
  - Keeps manufacturer conditions for medicines (no deblistering)
  - Uses bar code unit dose identification
  - Allows efficient use of medication
  - Optimizes inventory management
  - **BlisPack®** was launched in 2008

---

**StocKey® RFID**

RFID System to Monitor and Ensure Traceability of High Value Products in Real Time

- **Benefits:**
  - Improves cost efficiency by inventory monitoring
  - Provides real time visibility of the inventory
  - Improves critical inventory traceability
StocKey® Central
Logistics Management Software for Central Warehouses in the Healthcare Sector

- Benefits:
  - Improves efficiency, safety and reliability of medication picking
  - Provides concentration and optimization of warehouse space
  - Delivers integrated connectivity with the hospital information systems (HIS)
  - The first version of Silicon was launched in 2001.
  - Grifols has been providing pharmacy information systems since 1983
Financials
Financial Strength Drives Sustainable and Profitable Growth

Alfredo Arroyo
Chief Financial Officer

Robust Fundamentals
Fundamentals Drive Long-Term Value
Competitive Advantage Across Divisions

- Constant focus on **business fundamentals** and **long-term**
- Integrated business models to capture **opportunities across divisions**
- Demonstrated ability to successfully **grow businesses** both **organically** and through **acquisitions**
- **Strategic investments** bolster competitive advantage
- **Leader in plasma centers**, with more than 225 centers in the U.S. and Europe
- Emphasis on **cash generation**
- **Financial strength** provides further growth opportunities

Strengthening the Business With a Long-Term View
A Proven Track Record of Sustainable Growth

![Graph showing net revenues](image)

**CAGR: 11.0%**

- **Talecris** (EV $4.0bn)
- **Araclon** (51%)
- **Pregenika** (60%)
- **Novartis Transfusion Diagnostic** (EV $1.675bn) & **Kiro Grifols** (50%)
- **Hologic, share in NAT unit**
- **2016-2018 acquisitions**
  - Interstate Blood Bank (IBBI) (49%)
  - Singulex (20%)
  - Alkahest (48%)
  - KedPlasma (6 plasma centers in the U.S.)
  - Hologic share in NAT unit
  - Access Biologicals (49%)
  - Kiro Grifols (40%). Total stake: 90%
  - GigaGen (44%)
  - MedKeeper (51%)
  - Haema (100%)

1. 2011 figures for Talecris acquisition are pro forma
Financial Highlights

Solid Integrated Business Structure

Bioscience Division

- Solid upward growth
- Robust demand for main plasma proteins throughout 2017
- Plasma-derived products expect to continue growing fueled by favorable demand and supply dynamics, global expansion and innovation

![Graph showing earnings growth]

1.- Net revenues considering intersegment sales and the reclassification of sales of biological products for non-therapeutic use reported as Bio Supplies Division sales, from January 2017 onwards.
**Fully Integrated Transfusion Diagnostics**

**Diagnostic Division**

- Value capture from integration
- Highly profitable business
- Grifols’ comprehensive transfusional medicine portfolio delivers strong cash generation and top-line growth

![Graph showing Diagnostic Net Revenues (EUR in millions) with CAGR: 5.7%](image)

**Significant Growth Potential in the U.S.**

**Hospital Division**

- Growth driven primarily by IV saline solutions and the Pharmatech line - with higher growth projected following the MedKeeper acquisition
- Product portfolio expansion and focus on the U.S. market

![Graph showing Hospital Net Revenues (EUR in millions) with CAGR: 3.7%](image)

1.: Net revenues considering intersegment sales
Diversifying the Revenue Base
Bio Supplies Division

- Comprised mainly by sales of biological products for non-therapeutic uses and manufacturing agreements
- Highly profitable revenue stream

High Margins With Significant Cash Flow Generation
EBITDA and Margin

- Acquisition of the NAT share unit enabled Grifols to increase EBITDA margin and cash conversion rate
- Grifols has increased its efforts over recent years to grow plasma volume from existing centers and through new openings
Improving Bottom-Line Profitability
Demonstrated Ability to Grow Net Profit

- Double-digit growth over the last 4 years
- FY2017 recurring profits grew by 7.8% to EUR 588 million
- FY2017 reported profits grew by 21.5% to EUR 663 million
- Positive impact from U.S. tax reform

1. Non-recurring items and associated with recent acquisition, U.S. tax reform and reevaluation of Aradigm’s assets

1Q 2018 Performance
### 1Q 2018 Revenue Performance

**Consistent Delivery**

(EUR in millions)

<table>
<thead>
<tr>
<th></th>
<th>1Q 2018</th>
<th>1Q 2017</th>
<th>% Var. at cc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioscience</td>
<td>807.5</td>
<td>853.6</td>
<td>5.8%</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>164.9</td>
<td>175.1</td>
<td>4.0%</td>
</tr>
<tr>
<td>Hospital</td>
<td>27.3</td>
<td>23.9</td>
<td>18.1%</td>
</tr>
<tr>
<td>Bio Supplies</td>
<td>26.2</td>
<td>14.4</td>
<td>105.8%</td>
</tr>
<tr>
<td>Others</td>
<td>4.4</td>
<td>-n/m</td>
<td></td>
</tr>
<tr>
<td>Intersegments</td>
<td>-7.4</td>
<td>-5.4</td>
<td>52.6%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1,023.0</td>
<td>1,061.7</td>
<td>7.4%</td>
</tr>
</tbody>
</table>

- **Bioscience**: strong growth of the main proteins, which offset the decline in FVIII amid a tight plasma market
- **Diagnostic**: steady growth in the transfusion medicine business
- **Hospital**: robust double-digit growth driven by stronger performance in the U.S. on the back of IV Therapy and Pharmatech, including MedKeeper
- **Bio Supplies**: revenues doubled due to third-party manufacturing agreement

### 1Q 2018 Performance

**Steady Earnings Growth**

**EBITDA**

<table>
<thead>
<tr>
<th>Year</th>
<th>EBITDA (EUR millions)</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>323</td>
<td>+1%</td>
</tr>
<tr>
<td>2018</td>
<td>326</td>
<td></td>
</tr>
</tbody>
</table>

**Net Profit**

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Profit (EUR millions)</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>134</td>
<td>12.6%</td>
</tr>
<tr>
<td>2018</td>
<td>143</td>
<td>+7%</td>
</tr>
</tbody>
</table>

- Plasma costs
- Exchange rate variations
- Lower FVIII utilization
- Opex control / optimization
- Lower financial expenses
- Effective tax rate: c.20%
Capital Allocation

Consistent Capital Allocation Supports Profitable Growth
Capital Discipline Focused on Creating Value

**Strong Sources of Cash**
- Cash flow generation
- Solid Balance sheet

**Consistent Capital Allocation**
- Supporting business growth: Capex and R&D
- Value accretive acquisitions
- Dividends
Strong Sources of Cash: Excellent Cash Flow Generation

High Conversion of EBITDA Into Cash Flow\(^1,2\)

- Robust cash conversion and cash flow, improved following the integration of the NAT share unit
- In FY2017, net operating cash flow increased by 43% to close to EUR 1,040 million

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash conversion</th>
<th>Cash Flow (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>80% 840 EUR (M)</td>
<td>68% 688 EUR (M)</td>
</tr>
<tr>
<td>2015</td>
<td>75% 874 EUR (M)</td>
<td>70% 740 EUR (M)</td>
</tr>
<tr>
<td>2016</td>
<td>60% 686 EUR (M)</td>
<td>80% 960 EUR (M)</td>
</tr>
<tr>
<td>2017</td>
<td>74% 960 EUR (M)</td>
<td>75% 840 EUR (M)</td>
</tr>
</tbody>
</table>

\(^1\)- Cash flow conversion defined as EBITDA – Capex – Change in Working Capital / EBITDA
\(^2\)- Cash flow defined as EBITDA – Capex – Change in Working Capital

Strong Sources of Cash: Working Capital Optimization

Best-in-Class Receivables Management

- Working capital optimization focused on receivables
- Days sales outstanding dropped by more than 50% to 24 days from 55 days

<table>
<thead>
<tr>
<th>Year</th>
<th>DSO</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>55 days</td>
</tr>
<tr>
<td>2015</td>
<td>34 days</td>
</tr>
<tr>
<td>2016</td>
<td>37 days</td>
</tr>
<tr>
<td>2017</td>
<td>24 days</td>
</tr>
</tbody>
</table>
Consistent Capital Allocation: Capex
Capex Supports Long-Term Growth

- Capex plan 2016-2020: EUR 1.2bn
- Significant investments to support growth initiatives
- Over 50% of capex is dedicated to expansion
- Continued emphasis on execution and capital allocation efficacy and return

Consistent Capital Allocation: R&D Supports Long-Term Growth
Firm Commitment to an Integrated Approach

- R&D drives long-term growth and profitability
- Includes strategic collaborations: leveraging internal and external expertise
Consistent Capital Allocation: Value Accretive Acquisitions

Ability to Pursue Attractive Opportunities

- Integral part of Grifols’ strategy
- Targeted investments to support growth and maximize cash flow generation
- Focused on value accretive transactions
- Ability to capture opportunities
- Best-in-class M&A deal execution and seamless integration
- Continuous improvement in financial terms

Consistent Capital Allocation: Value Accretive Acquisitions

Growing Value Through Strategic Decisions

<table>
<thead>
<tr>
<th>January 2017</th>
<th>January 2017</th>
<th>February 2017</th>
<th>July 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hologic’s share of NAT screening unit</td>
<td>Access Biologicals</td>
<td>6 plasma centers in the U.S. (Kedplasma)</td>
<td>GigaGen</td>
</tr>
<tr>
<td>USD 1,850m</td>
<td>49% stake USD 51m</td>
<td>USD 47m</td>
<td>44% stake USD 35m</td>
</tr>
<tr>
<td>Creates a vertically integrated NAT business across R&amp;D, manufacturing, sales and marketing and corporate functions</td>
<td>Manufacture of biological products for non-therapeutic uses including plasma reagents to support specific in-vitro diagnostic and R&amp;D activities</td>
<td>6 plasma centers as of March 1, 2017</td>
<td>Biopharmaceutical firm specialized in the development of innovative monoclonal and polyclonal antibody therapies</td>
</tr>
<tr>
<td>Captures operational efficiency across the whole value chain</td>
<td>5-year call option</td>
<td>300,000 liters</td>
<td></td>
</tr>
<tr>
<td>The acquisition transformed Diagnostic into an integrated, high-margin business</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

357 | 2018 Investor and Analyst Meeting | Barcelona

358 | 2018 Investor and Analyst Meeting | Barcelona
Consistent Capital Allocation: Value Accretive Acquisitions

Growing Value Through Strategic Decisions

<table>
<thead>
<tr>
<th>January 2018</th>
<th>March 2018</th>
<th>May 2018</th>
<th>1Q 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>MedKeeper</em></td>
<td><em>Haema</em></td>
<td><em>Agreement with Boya Bio-Pharmaceutical</em></td>
<td><em>IBBI</em></td>
</tr>
<tr>
<td>51% stake</td>
<td>Full ownership</td>
<td>Euros 25m</td>
<td>51% stake</td>
</tr>
<tr>
<td>USD 98m</td>
<td>Euros 220m</td>
<td></td>
<td>USD 100m</td>
</tr>
<tr>
<td>U.S.-based technology firm that develops mobile and web-based solutions to enhance hospital pharmacy operations</td>
<td>With 35 centers, operates the largest independent network of donation centers in Germany and offers a range of transfusion medicine services 800,000 liters</td>
<td>Plasma collection centers to be built and managed in adherence to the criteria established by the health authorities of the United States, the European Union and China</td>
<td>1Q 2019 execution of option to acquire the remaining 51%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Includes 8 whole blood centers, 22 plasma centers and a laboratory that provides human blood and/or blood components to the therapeutic and diagnostic industries 900,000 liters</td>
</tr>
</tbody>
</table>

Consistent Capital Allocation: Dividends

Sharing Success With Shareholders

- Established dividend policy, including payout ratio of 40% of consolidated group profit
- Consistent growth of cash dividend payment
- Strong earnings profile
- Maintenance of financial strength
Well Balanced Financing Mix and Long-Term Debt Maturity Profile

Debt\(^1\) Maturity Profile: c.6-year Average Tenor

<table>
<thead>
<tr>
<th>Financing mix(^3)</th>
<th>Maturity profile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(USD in millions)(^2)</td>
</tr>
<tr>
<td></td>
<td>2018</td>
</tr>
<tr>
<td>EIB (EUR) 2%</td>
<td></td>
</tr>
<tr>
<td>Bond (EUR) 16%</td>
<td></td>
</tr>
<tr>
<td>Institutional credit facilities (USD) 39%</td>
<td></td>
</tr>
<tr>
<td>Bank credit facilities (USD) 31%</td>
<td></td>
</tr>
<tr>
<td>Other debt 3%</td>
<td></td>
</tr>
<tr>
<td>Drawn debt</td>
<td>30</td>
</tr>
</tbody>
</table>

Average interest rate c.3.5\% per annum

Average maturity 6 years

1. Excludes RCF and any other non-financial debt
2. Fixed USD/EUR exchange rate of 1.1
3. As of December 31, 2017

A Unique Competitive Position
Continuous Efforts to Enhance Growth and Margin - Actions

Pulling All Levers

- **Bioscience** drives organic growth through diagnosis/treatments and expansion into new markets
- **Productivity initiatives** to boost plasma collection and overcome plasma tightness
- **Plasma supply**: significant capex allocated to open new collection centers and relocate/improve/upgrade existing centers. Expansion and diversification through acquisitions and integration
- Leverage **leadership position in Diagnostic transfusion medicine** to boost growth of immunohematology and hemostasis
- **Hospital to increase scale** and profitability while expanding its presence in the U.S. market
- **Increased R&D investments** over the last years will trigger future sales growth
- Bolt-on acquisitions, partnerships and agreements will further reinforce short-term growth across divisions

Continuous Efforts to Enhance Growth and Margin - Results

Pulling All Levers

- **Significant collection growth** over recent months. **Productivity ramp-up** in new centers is ahead of schedule, leveraging cost per liter of plasma
- Increase and diversify in-house plasma collections and acquisitions to support sales growth and enable company to meet current strong demand
- **Value accretive acquisitions**
- **Regulatory approvals** across all divisions: Prolastin®-C Liquid; Fibrin sealant; Hyper-rabies; genetic test for alpha-1; hemostasis; saline solution and Grifols Misterium® cleanroom solutions
- **Beckman-Coulter agreements** to support specialty Diagnostic sales growth
- **Additional market expansion** in France, UK, Germany and Asia Pacific (China and India)
Continued Commitment to Growing Shareholder Value

Consistent Growth in Dividends
Dividend Grows by Double Digits for the Last 4 Years

- Accumulated annual dividend up by 12.1% over the last 4 years
- More than EUR 800m returned to shareholders over the last 4 years
- Continuous DPS increase on the back of profit growth

(EUR per share)

<table>
<thead>
<tr>
<th>Year</th>
<th>Dividend (EUR per share)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>0.27</td>
</tr>
<tr>
<td>2015</td>
<td>0.31</td>
</tr>
<tr>
<td>2016</td>
<td>0.32</td>
</tr>
<tr>
<td>2017</td>
<td>0.38</td>
</tr>
</tbody>
</table>

CAGR: 12.1%
Key Takeaways

Committed to Long-Term Sustainable and Profitable Growth

CONSISTENT DELIVERY

- Relentless focus on **business fundamentals** and **long term**
- Maintain long term growth and profitability:
  - Steady **sustainable growth** of **core Bioscience products**
  - **Strengthening our leadership** in transfusion medicine
  - Significant **boost** in the **Hospital Division growth**
- As the **industry leader** in plasma **collection** and **manufacturing capacity**, Grifols is in a **unique position to benefit from accelerated growth** in the plasma business
- **On track** to continue delivering **profitable growth** and **cash generation**
Key Takeaways
Committed to Long-Term Sustainable and Profitable Growth

CAPITAL ALLOCATION
• Continuous support to fund business growth, with a strong commitment to innovation
• Capital allocation focus on manufacturing and plasma collection capacity increase

VALUE CREATION
• Grifols will continue to grow dividend per share supported by growth in underlying earnings

Grifols competitive advantages drive long-term sustainable and profitable growth

Closing
Grifols Value Grid (GVG)

Víctor Grífols Deu
Co-CEO
Grifols Value Grid

Keeping always in mind...

- Donors
- Patients
- Investors
- Healthcare professionals
- Talent pool
- Development of society

... and keeping our Grifols spirit
2018 Investor and Analyst Meeting

Barcelona
7th and 8th June