



# CytoSorbents™

HELPING REDUCE DEADLY UNCONTROLLED INFLAMMATION IN HOSPITALIZED PATIENTS WORLDWIDE

NASDAQ: CTSO  
Investor Presentation  
June 2017

# Safe Harbor Statement

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This presentation contains “forward-looking statements” pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements include, without limitation, any statement that may predict, forecast, indicate, or imply future results, performance or achievements, and may contain the words “estimate,” “intend,” “target,” “will,” “is likely,” “would,” “may,” or, in each case, their negative, or words or expressions of similar meaning. These forward-looking statements are found at various places throughout this presentation and include information concerning possible or assumed future results of our operations; business strategies; future cash flows; financing plans; plans and objectives of management; any other statements regarding future operations, future cash needs, business plans and future financial results, and any other statements that are not historical facts. Unless otherwise indicated, the terms “CytoSorbents,” “Company,” “we,” “us” and “our” refer to CytoSorbents Corporation. Any or all of the forward-looking statements included in this presentation are not guarantees of future performance and may turn out to be inaccurate. These forward-looking statements represent our intentions, plans, expectations, assumptions and beliefs about future events and are subject to risks, uncertainties and other factors. Many of those factors are outside of our control and could cause actual results to differ materially from the results expressed or implied by those forward-looking statements. Although these expectations may change, we are under no obligation to inform you if they do. Actual events or results may differ materially from those contained in the forward-looking statements. The following factors, among others, could cause our actual results to differ materially from those described in a forward-looking statement: our history of losses; potential fluctuations in our quarterly and annual results; competition, inability to achieve regulatory approval for our device, technology systems beyond our control and technology-related defects that could affect the companies’ products or reputation; risks related to adverse business conditions; our dependence on key employees; competition for qualified personnel; the possible unavailability of financing as and if needed; and risks related to protecting our intellectual property rights or potential infringement of the intellectual property rights of third parties. This list is intended to identify only certain of the principal factors that could cause actual results to differ from those discussed in the forward-looking statements. In light of these risks, uncertainties and assumptions, the events described in the forward-looking statements might not occur or might occur to a different extent or at a different time than we have described. You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of the applicable presentation. You are referred to a discussion of important risk factors detailed in the Company’s Form 10-K filed with the Securities and Exchange Commission on March 3, 2017 and other reports and documents filed from time to time by us, which are available online at [www.sec.gov](http://www.sec.gov).

# CytoSorbents At a Glance

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- NASDAQ-traded (CTSO): ~\$4.00 per share
- 70 employees with international footprint across two wholly-owned subsidiaries
  - CytoSorbents Medical, Inc - Monmouth Junction, NJ
    - Headquarters, ISO 13485 manufacturing, QA/QC, R&D
  - CytoSorbents Europe GmbH: International sales office - Berlin, Germany
- CytoSorb<sup>®</sup>, is E.U. approved, with 23,000+ treatments; distributed in 43 countries
- Trailing 12-month sales of \$9.2M vs \$4.9M a year ago, blended gross margins = 68%
- Strategic Partnerships with Fresenius Medical Care, Terumo, Biocon, and Dr. Reddy's
- Strong government support with \$19M+ in grants, contracts, other non-dilutive funding
- Pursuing U.S. approval of CytoSorb<sup>®</sup> in cardiac surgery
- Russell Microcap Index listed with coverage by Cowen, HCW, Aegis, B Riley, Maxim & Zacks
- ✓ **With continued growth, expect to achieve operating profitability in 2018**
- ✓ **Plan to begin U.S. pivotal, registration trial for CytoSorb this year, pending FDA review**

# Leadership Background



## **Phillip Chan, MD, PhD – Chief Executive Officer and President**

Former Partner at the \$80M NJTC Venture Fund, leading life science investments for 5 years. Co-founder of Andrew Technologies, commercializing its HydraSolve™ lipoplasty device in the U.S. MD/PhD from Yale School of Medicine, internal medical residency at the Beth Israel Deaconess Medical Center at Harvard.



## **Vincent Capponi, MS - Chief Operating Officer**

20+ years experience in the medical device, pharmaceutical and imaging fields. Led the first regulatory approval for the heparin flush syringe, used worldwide in hospitals, and managed manufacturing of > 1 million units/week



## **Kathleen Bloch, MBA, CPA – Chief Financial Officer**

20+ years as CFO of private and public companies. Former Laureate Biopharma CFO, a contract biopharmaceutical manufacturer, and CFO of Silverline Windows, a \$750M revenue window manufacturing company with 9 manufacturing plants nationally



## **Eric Mortensen, MD, PhD - Chief Medical Officer**

25 years leading clinical trials for key programs at Pfizer, GSK, and Merck. Most recently Vice President & Therapeutic Area Clinical Head for Inflammation and Immunology at Pfizer, leading the company's global late-stage development organization for programs in inflammation including studies for Enbrel and Xeljanz



## **Christian Steiner, MD – Vice President of Sales and Marketing**

15+ years experience in sales and marketing of extracorporeal therapy and critical care sales at Teraklin for MARS, the first liver failure dialysis technology, and at Pulsion Medical (hemodynamic monitoring)



## **Christopher Cramer, MS, MBA – Vice President of Business Development**

15+ years experience in business development and commercial experience. Former Senior Director of New Venture Development at Johnson & Johnson, and previously at PwC Consulting

# Uncontrolled Inflammation is Deadly

Sepsis



Trauma



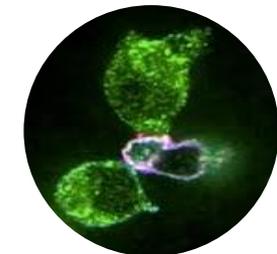
Burn Injury



Influenza



Millions Die  
Of Uncontrolled  
Deadly  
Inflammation  
Each Year



Cytokine Release  
Syndrome



Lung Injury



Pancreatitis



Surgical Complications



Liver Failure

# Massive Inflammation Causes Organ Failure

Organ failure occurs when vital organs stop working, **causing nearly half of all deaths in the ICU.**



Little can be done to prevent or treat organ failure today

# No Ideal Options to Treat Severe Inflammation

## **Anti-Inflammatory (too weak)**

**NSAIDs**

**Aspirin**

**Anti-cytokine  
antibodies**

**Anti-integrin  
antibodies**

**Anti-oxidants**

## **Immunosuppressive (too strong)**

**Corticosteroids**

**Chemotherapy**

**Organ transplant  
Anti-rejection drugs**

**Radiation**

**Immune system  
ablation**

**Anti-leukocyte Abs**

# CytoSorb is a Better Alternative

## Anti-Inflammatory (too weak)

NSAIDs

Aspirin

Anti-cytokine  
antibodies

Anti-integrin  
antibodies

Anti-oxidants



## Immunosuppressive (too strong)

Corticosteroids

Chemotherapy

Organ transplant  
Anti-rejection drugs

Radiation

Immune system  
ablation

Anti-leukocyte Abs

# CytoSorb® Removes the Fuel to the Fire

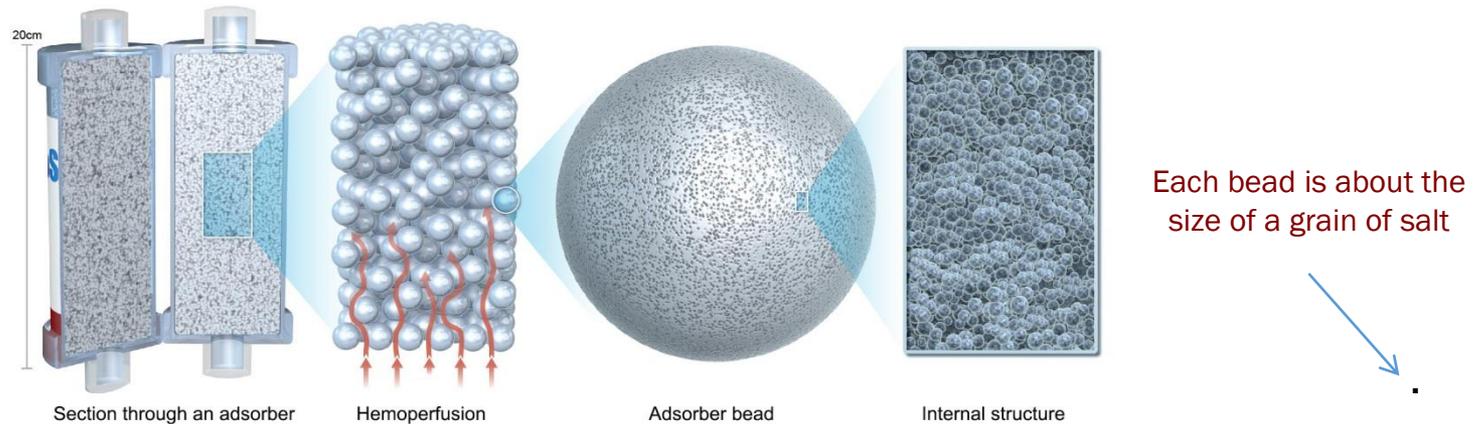
- CytoSorb® targets the \$20+ billion opportunity in critical care and cardiac surgery
- Approved in the European Union as the only specifically approved extracorporeal cytokine filter
- Broad indication for use where cytokines are elevated
- Removes cytokines and many other inflammatory mediators such as free hemoglobin, bacterial toxins, myoglobin, and activated complement
- Works with standard dialysis and heart-lung machines
- Safe and well-tolerated: In ~23,000 human treatments, up from 12,000 a year ago



\*CytoSorb is not yet approved in the U.S.

# Patented Blood Purification Technology

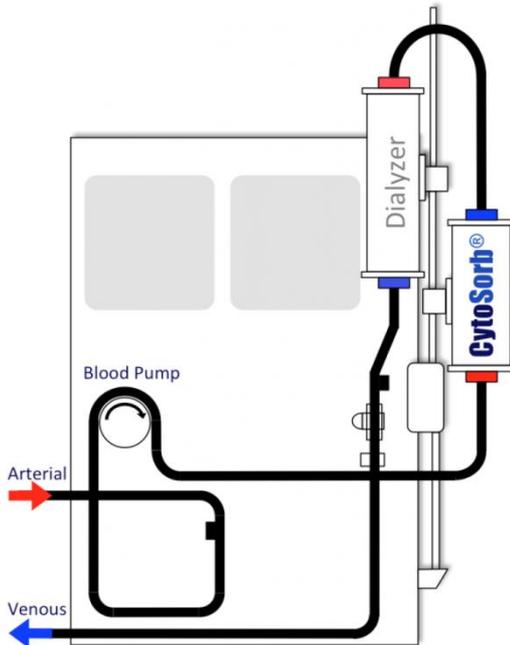
The underlying blood purification technology is based on biocompatible, highly porous polymer beads that act like tiny sponges to remove harmful substances from blood



- Protected by 32 issued US patents and multiple applications pending worldwide
- Manufactured at our ISO 13485 certified facility in New Jersey
- One of the highest grade medical sorbents on medical market today

# CytoSorb is “Plug and Play”

## Compatible with Existing Dialysis and Heart-Lung Machines



- Place a temporary dialysis catheter in a major vein
- Connect the device to a standard dialysis or heart-lung machine found in hospitals worldwide
- Pump blood out of the body and through the cartridge
- The polymer beads directly contact blood and remove unwanted or toxic substances
- “Purified” blood is pumped back into the patient
- Can treat 70+ total blood volumes per 24 hour treatment
- Each treatment uses a new cartridge

# Case Report: Toxic Shock Syndrome

- 17 year old man suffered an injury to his ankle and unexpectedly began to develop fever
- He rapidly deteriorated and was hospitalized the next day at a major hospital in Rotterdam, Netherlands where antibiotics were started immediately. He continued to decline and was admitted to the ICU where he went into shock.
- Patient became globally red and swollen, and was suspected to have toxic shock syndrome.
- Surgical exploration of the injured ankle revealed a Staphylococcal infection, confirming the diagnosis
- Patient was still in shock and developed respiratory failure requiring intubation
- Patient was started on CytoSorb and within 5 minutes his blood pressure increased
- After three hours of treatment, the patient's swelling and redness had resolved
- Total CytoSorb® treatment was only 14 hours. Patient went on to fully recover



# Blood Purification Alternatives

Sorbents

HMCO Filters

Coupled Plasma  
Filtration Adsorption

Therapeutic  
Plasma Exchange



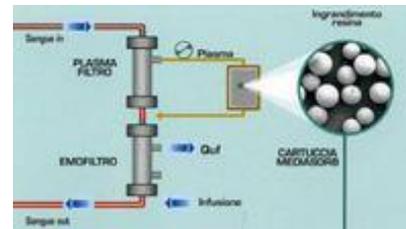
CytoSorb –  
CytoSorbents



EMiC2 - Fresenius

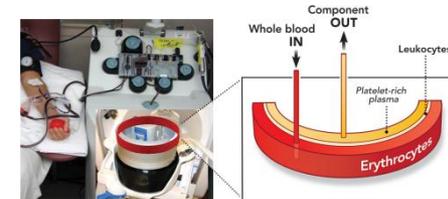
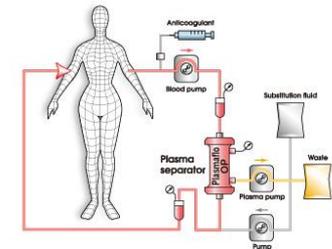


SepteX – Gambro

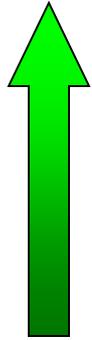


CPFA - Bellco  
I.M.P.A.C.T - Hemolife

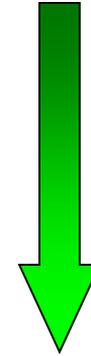
Circuit diagram of PE



# Goal: To Prevent or Treat Organ Failure

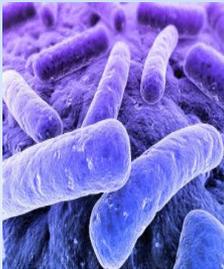


Improve  
Patient  
Outcome  
and  
Survival

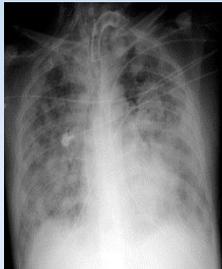


Decrease  
Costs Of  
ICU and  
Patient  
Care

Sepsis



ARDS



Burn Injury



Trauma



Pancreatitis



Influenza



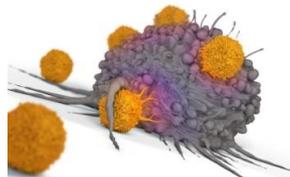
Surgical



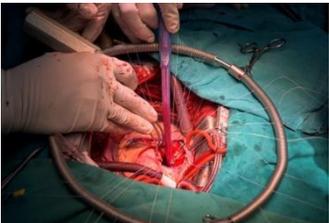
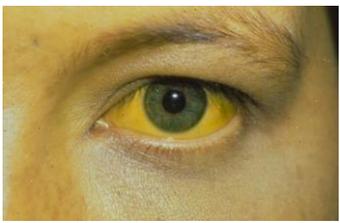
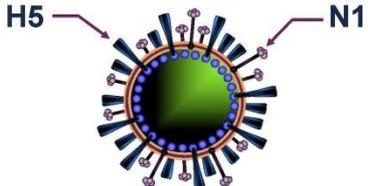
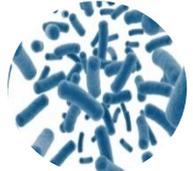
The Potential to Revolutionize Critical Care Medicine

# The World Needs CytoSorb®

CytoSorbents™



## H1N1



# CytoSorb

23,000+ Treatments

43 Countries Worldwide

**Critical Care**  
18,000+

**Cardiac Surgery**  
5,000+

United States

Cardiac Surgery



  
REFRESH I 

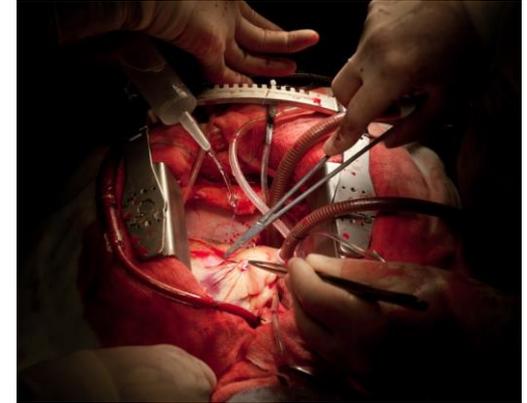
↓  
REFRESH 2   
Start  
2H 2017

↓  
  
2020 

\$9.2M Sales 58+ Investigator Initiated Studies

# Cardiac Surgery Drives Dangerous Inflammation

- Heart disease is the leading cause of death worldwide driven by smoking, unhealthy lifestyles, and an aging population
- ~1M cardiac surgeries performed annually in U.S. and E.U.
  - Coronary artery bypass graft surgery
  - Valve repair or replacement
  - Heart or lung transplantation
  - Congenital defect repair
  - Aortic reconstruction
- Complex cardiac surgeries require long heart-lung machine pump times, resulting in:
  - ↑ Hemolysis and free hemoglobin
  - ↑ Inflammatory mediators, cytokines, and activated complement



**Severe inflammation, nitric oxide scavenging, and reduced blood flow can lead to kidney, lung, and/or heart failure in many patients following surgery**

# U.S. REFRESH 1 Trial

## REduction in FREe Hemoglobin



- 46-patient, eight-center trial evaluating the safety and efficacy of intra-operative use of CytoSorb® in a heart-lung machine during complex cardiac surgery in elective, non-emergent cardiac surgery  $\geq 3$  hours

- Working with major cardiac surgery centers

- Baylor and Texas Heart Institute
- Baystate Medical Center
- Columbia University
- Cooper University Hospital
- University of Kentucky
- University of Maryland
- University of Pennsylvania
- University of Pittsburgh

CPB Length	Mean Reduction of pfHb (mg/dL)	P-value
3.0	35 mg/dL	0.09
3.5	48 mg/dL	0.05
4.0	61 mg/dL	0.05
4.5	74 mg/dL	0.07

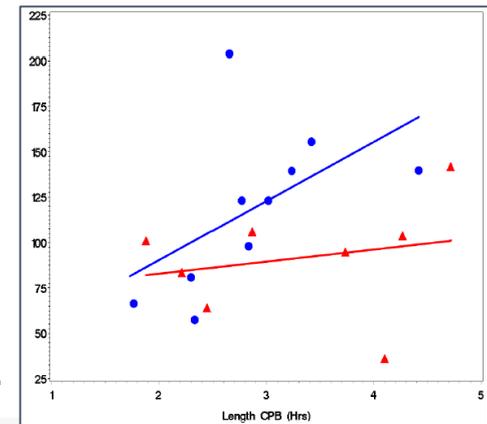
- Primary endpoints were safety and reduction in plasma free hemoglobin (pfHb) levels

- First RCT using CytoSorb in high risk cardiac surgery

- Demonstrated safety
- Identified valve replacement patients who are the highest levels of peak pfHb
- Demonstrated that CytoSorb significantly reduces pfHb and activated complement during treatment in this population

- Data from the REFRESH 1 Trial was submitted as a late-breaking abstract and was selected for podium presentation at the American Association of Thoracic Surgery (AATS) conference on May 1, 2017. The paper has been submitted for publication

▲ CytoSorb n = 8  
● Control n = 10



# U.S. REFRESH 2 Pivotal Trial

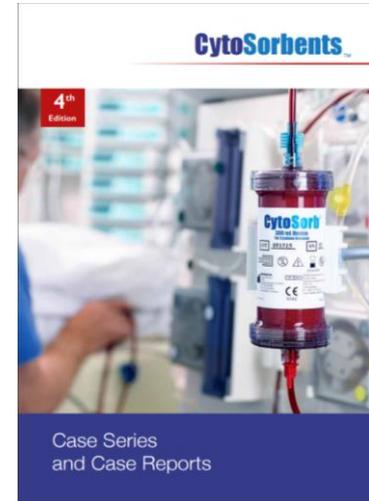


- Plan to meet with the FDA in the near term to confirm the clinical trial strategy and trial design for REFRESH 2 cardiac surgery, with goal to start trial 2H 2017
- REFRESH 2 is expected to be similar in design to REFRESH 1, but enriched with patients undergoing valve replacement patients, who have the highest levels of pfHb and at greatest risk for organ injury
- Preliminary trial design, pending discussions with the FDA:
  - Plan to start with core sites from REFRESH 1
  - 300-500 patient, 30-40 center randomized, controlled PMA trial
  - Primary clinical and cost-effectiveness endpoints: Progression to acute kidney injury (AKI), incidence of stroke, time on mechanical ventilation, hemodynamic stability, days in the ICU
  - 2 year expected duration at 0.5 patients/month/site
  - \$10-12M cost spread out over 3 years – potential for strategic partner support
  - Targeting 1H 2019 enrolled, 2H 2019 data, 2020 targeted approval

# Numerous Clinical Studies Being Published

## PUBLISHED

- Breakthrough publication on 22 patients in refractory septic shock
  - Unexpectedly high shock reversal and much improved survival vs historical
- Biggest endocarditis case series to date in cardiac surgery (39 patients)
  - Improved stability and very good safety and feasibility
- First review article on use of CytoSorb in septic shock
  - Summarizes the positive clinical results so far while confirming safety
- Case series on septic shock patients
  - Improved outcome (survival); earlier CytoSorb therapy increases therapeutic success
- Largest animal sepsis study to date
  - Improved cardiac function and increased survival in septic rats with CytoSorb treatment



## PENDING

- REFRESH I trial
- Interim analysis of International CytoSorb Registry in ~200 patients
- 30 patient case series in septic shock
- Case reports on antidepressant intoxication treatment, toxic shock syndrome, and many others

Please visit [CytoSorb.com](https://www.cytosorb.com) under “Case of the Week”

# ISICEM 2017 - Brussels

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Attendees at ISICEM Brussels 2017 waiting for access to our CytoSorb Satellite symposium

# 37<sup>th</sup> ISICEM – Research Symposium



## EXHIBITORS

← **SILVER FOYER**  
CYTOSORBENTS EUROPE

↘ **WAY TO BOZAR**

- BIOMED CENTRAL – CRITICAL CARE
- ICU MANAGEMENT & PRACTICE
- JAMA NETWORK
- MEDITHEQUE BOOKSHOP
- WISEPRESS
- AMIB
- VISITBRUSSELS

"ALL OTHER EXHIBITORS CAN BE FOUND IN THE EXHIBITION AREA, LEVEL -2"



**CytoSorbents**

### CytoSorbents Satellite Symposium

ISICEM | Brussels | 2017

CytoSorb<sup>®</sup> in old SIRS and new sepsis – Moving up to the next level  
Chair: J. Kuban, Pittsburgh, USA & M. Singer, London, UK

Spicing up clinical research – New data and knowledge  
E. Engelholm, Düsseldorf, Germany

Individualize treatment – Patient selection, timing and monitoring  
P. Singer, Leipzig, Germany

Resuscitating hemostasis – Liver failure, hyperfibrinolysis and DIC  
A. Wernke, Hamburg, Germany

Wednesday, March 22, 2017  
11:30am – 01:30pm  
Lunch and tea  
Lunch bags provided!

We will be happy to welcome you at our booth!

CytoSorbents Europe GmbH  
Am Markt 10 | 42699 Solingen | Germany  
www.cytosorbents.com



# 4<sup>th</sup> International CytoSorb Users Meeting

Successful 4<sup>th</sup> International CytoSorb Users' Meeting 2017  
*120 participants from 22 countries!*



# 2017 Distributor's Meeting



# CytoSorb® Is Like a High Margin Razorblade

- CytoSorbents is a pure play high margin disposables business where the CytoSorb “razorblade” is fully compatible with the existing installed base of “razor” ICU dialysis and ECMO machines, and heart-lung machines in the operating room
- Blended gross margins are 68%, but with economies of scale and manufacturing efficiencies, this is expected to increase
- Average Direct Selling Price is approximately \$1,000 per cartridge
- Approximately 1 - 10 cartridges are typically used per patient. Open heart surgery uses 1-2 cartridges, treatment of sepsis uses 3-5 cartridges. An entire course of treatment for sepsis is roughly the cost of 1 day in the ICU
- In Germany, 400 hospitals have >400 beds. Each of these hospitals is expected to see 300 to 600 sepsis patients per year. At 3-5 cartridges per patient:
  - Revenue per patient = ~\$3,000-5,000
  - Potential revenue per hospital = \$1-3M for sepsis alone
- One hospital in Germany had achieved sales of >\$1M in 2016, demonstrating early validation of this model

# Direct Sales: Expanded to 5 Countries

CytoSorbents' direct sales force focused on most major university and public hospitals in Germany, Austria, Switzerland, Belgium and Luxembourg. German market alone is \$1.0-1.5 billion



**Dr. Christian Steiner, MD**  
Vice President – Sales and Marketing and General Manager  
CytoSorbents Europe GmbH



**Stefan M. Baudis**  
International Sales Director



**Dr. Joerg Scheier, MD**  
Senior Medical Director Europe



**Dr. Volker Humbert, MD**  
Senior Manager - Clinical Affairs



**Dominik Gutzler**  
Head of Product Management



**Dr. Rainer Kosanke, PhD**  
Director Scientific Affairs Europe



**Alexandru Bojan**  
Regional Sales Director



**Adrian Thomas**  
Regional Sales Director



**Linus Khoo**  
Regional Sales Director



**Hans-Juergen Kraus**  
Regional Sales Manager  
Southern Germany



**Matthias Hoeldtke**  
Regional Sales Manager  
Southeast Germany



**Uwe Gerks**  
Regional Sales Manager  
Northern Germany



**Andreas Gassmann**  
Sales Representative  
Southern Germany



**Christian Koptik**  
Regional Sales Manager  
Austria



**Martin Scherer**  
Regional Sales Manager  
Southwest Germany



**Andreas Pendleder**  
Regional Sales Manager  
Western Germany



**Steffen Martens**  
Regional Sales Manager  
Northeast Germany



**Oliver Lupoli**  
Country Sales Manager  
Switzerland



**Brigitta Waldmueller**  
Application Specialist  
Austria



**Eva Wechsler**  
Application Specialist



**Fernanda Goncalves Zawieja**  
Sales Assistant/Customer Support



**Petra Hoffman**  
Sales Assistant/Customer Support



**Anke Applehoff**  
Application Specialist



**Franziska Preissing**  
Senior Manager – Reimbursement & Health Economics



**Kristin von Hammerstein**  
Marketing Manager



**Harriet Adamson**  
Clinical Research Manager

# Dedicated Reimbursement In Germany

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- CytoSorb has achieved a permanent, dedicated reimbursement code in Germany – our most important market and the largest medical device market in Europe
- We believe this has the potential to validate the importance of our therapy to physicians in the country
- Was achieved rapidly through the initiative and strong support of several major medical societies across different medical specialties
- Effective January 1, 2017, we are already seeing that the new code has resulted in higher reimbursement compared to the more generic code we have used, which we believe in many cases led to inadequate reimbursement, impeding usage and sales
- The company expects that the new code will catalyze increases in usage and sales of CytoSorb in Germany, and positively impact reimbursement in other countries

# CytoSorb® Distributed in 43 Countries



Dr.Reddy's



HOANG LONG PHARMA

IntensivMed

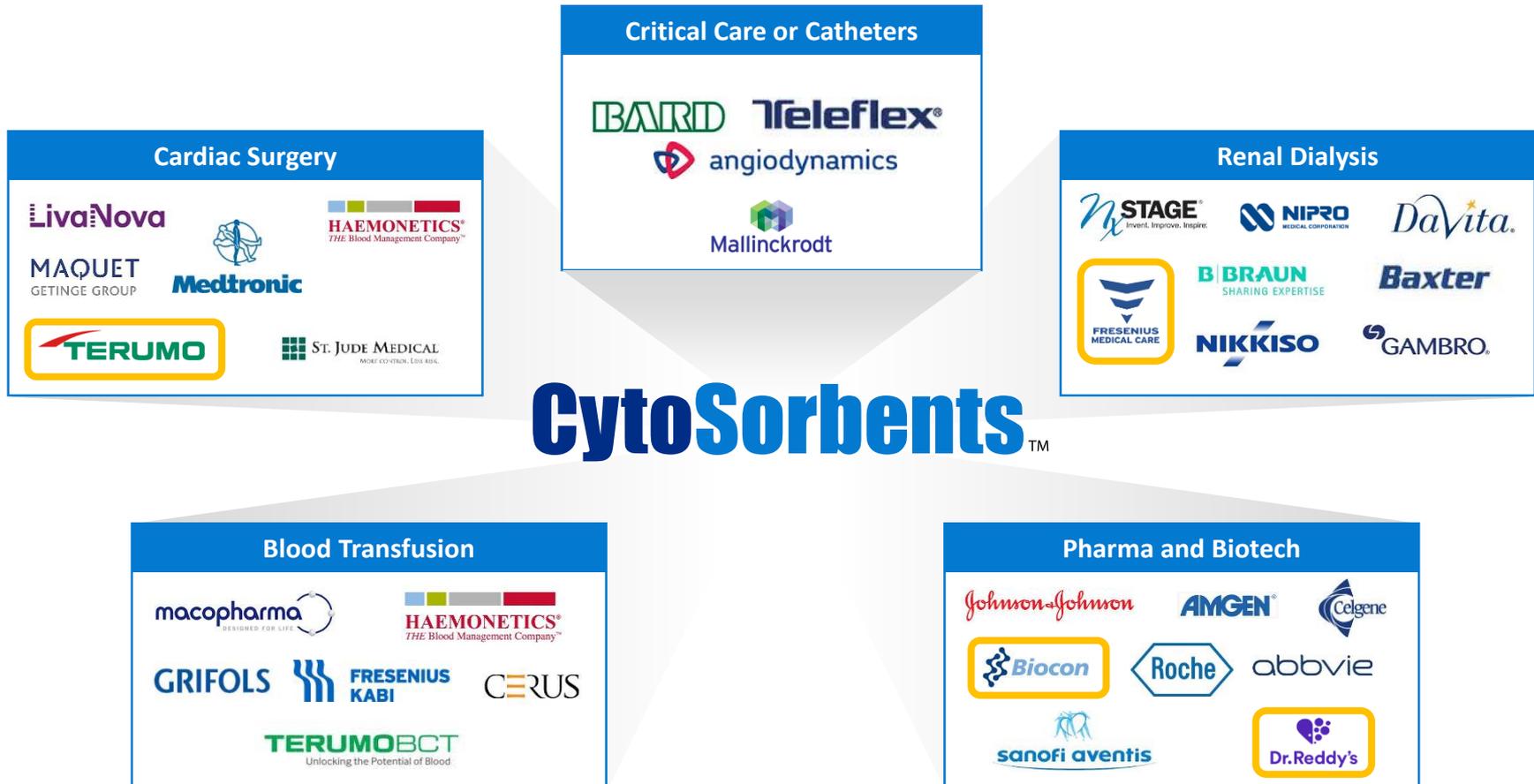


TekMed



WMC

# Four Major Partnerships, Potential for More



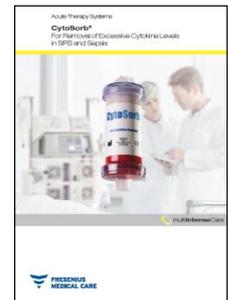
Partnered with leading multinational corporations:

Fresenius Medical Care, Terumo Cardiovascular, Biocon Ltd, and Dr. Reddy's Laboratories

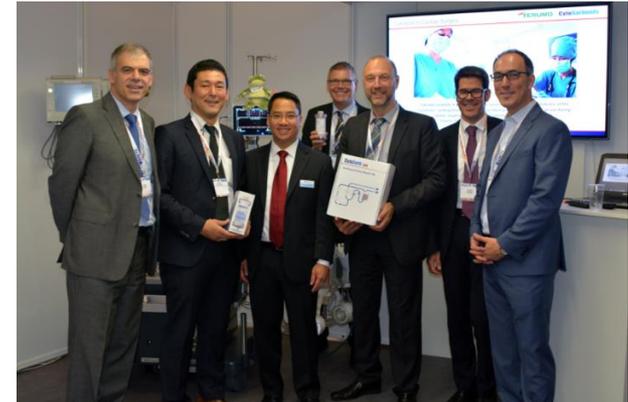
\* Companies listed here are used simply as examples of companies in these respective verticals. We make no other representations as to our relationship with any of these companies.

# Expanded Fresenius Partnership

- CytoSorbents renewed and expanded its partnership with Fresenius Medical Care in January 2017
- Extension on exclusive distribution of CytoSorb for critical care applications in France, Poland, Denmark, Norway, Sweden, and Finland through 2019
- Guaranteed minimum quarterly orders and payments of CytoSorb evaluable every 1.5 years
- Co-marketing agreement across all of the countries where CytoSorb is sold, where possible
  - May increase the “effective” sales force in each country
  - Fresenius to provide written endorsement of CytoSorb for the multiFiltrate platform
  - Jointly developed marketing materials



- Entered into a multi-country strategic partnership with Terumo Cardiovascular Group, a global leader in medical devices for cardiac and vascular surgery
- Initial exclusive distribution of CytoSorb® CPB Procedure Pack for intra-operative use during cardiac surgery in France, Denmark, Norway, Sweden, Finland, and Iceland
- Launched December 2016
- We believe this strategic partnership has the potential to validate our technology and opens the door to potential expansion to other countries, such as Japan – the second largest medical device market in the world



# Launch of New Therapeutic-ECMO Kit

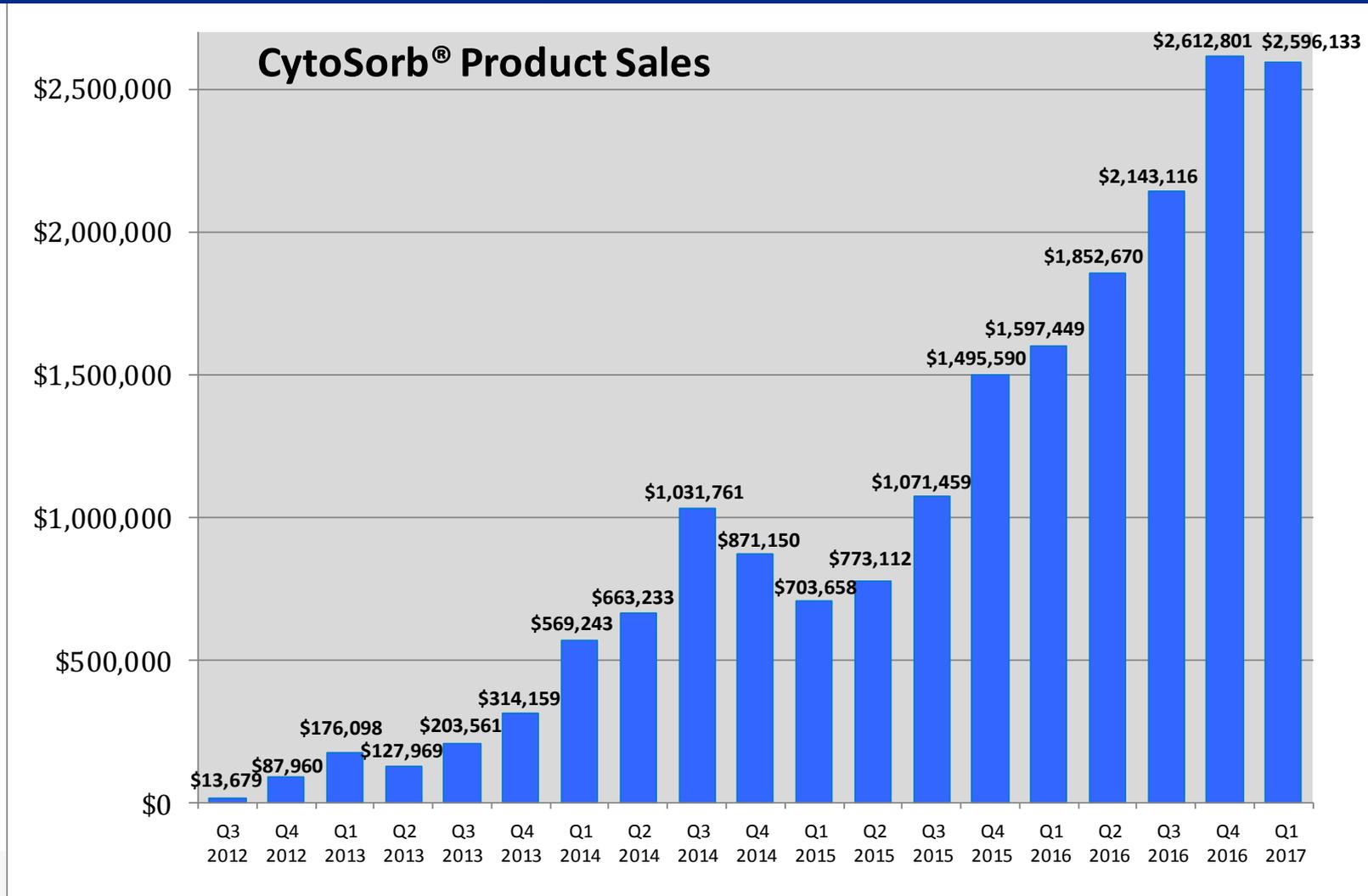
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- Respiratory failure is often caused by excessive inflammation causing capillary leak syndrome in the lungs – “drowning from inside out”
- Mechanical ventilation for respiratory failure is dangerous: oxygen toxicity, pressure and volume trauma on lungs, complications like ventilator acquired pneumonia, pneumothorax, and ventilator dependence
- Extracorporeal membrane oxygenation (ECMO) is a supportive care therapy that is increasing in popularity as an alternative to mechanical ventilation as a way to provide gas exchange, and sometimes hemodynamic support, in critically-ill patients
- ECMO is typically used as a rescue therapy for those failing mechanical ventilation
- Both standard mechanical ventilation and ECMO do not directly address the underlying cause of disease, only helping keep the patient alive
- Therapeutic-ECMO, or the combination of ECMO with CytoSorb, has been used reduce cytokines and other inflammatory mediators in 1,000+ treatments as a lung-preservation strategy for gas exchange. We are now launching a specific ECMO kit enabling safe and rapid connection of CytoSorb to ECMO

# Quarterly Product Sales

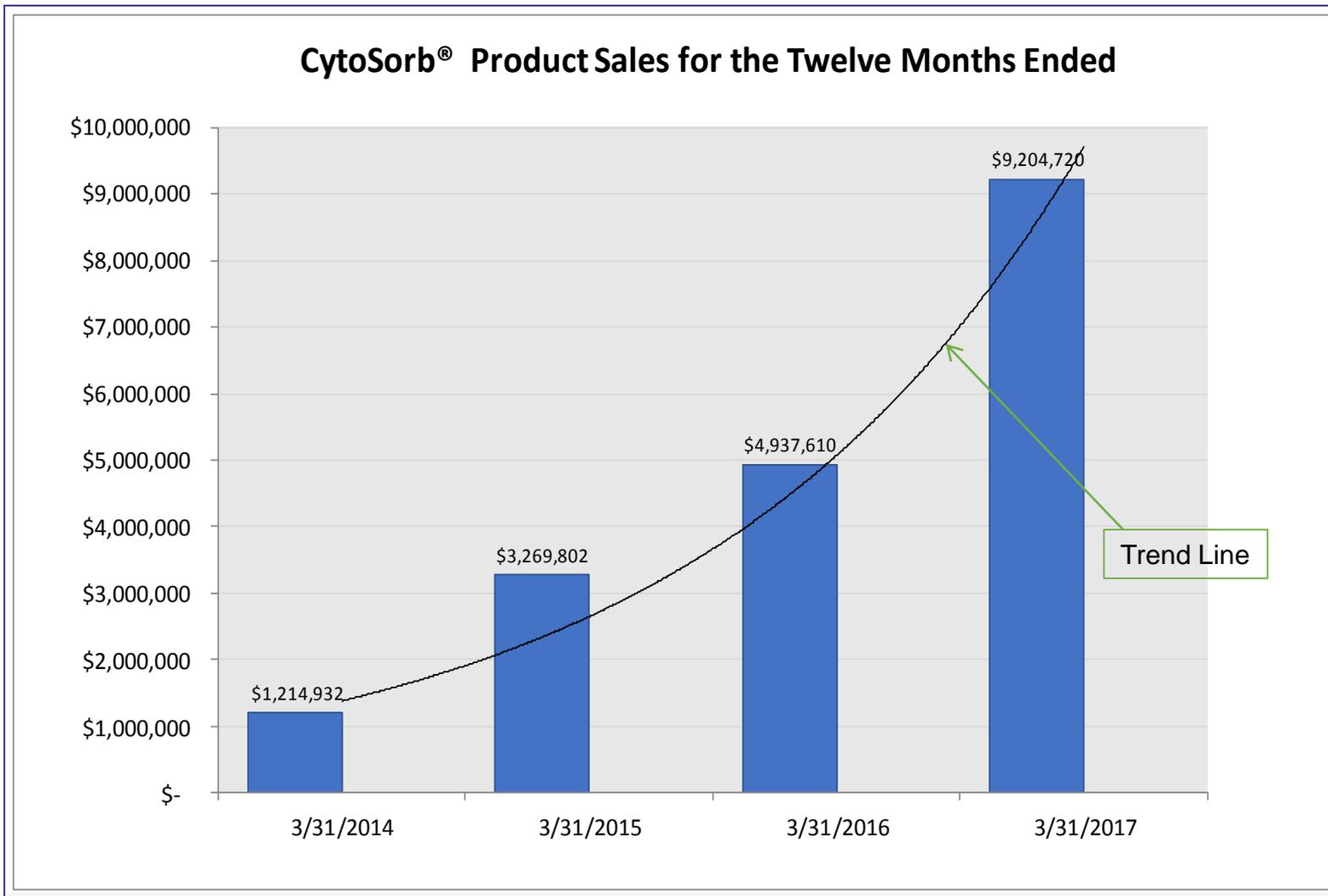
Product gross margins were approximately 68% for Q1 2017

## CytoSorb® Product Sales



# Trailing 12-month Product Sales

## CytoSorb® Product Sales



# Manufacturing Buildout Underway



Reaction Hoods Under Construction

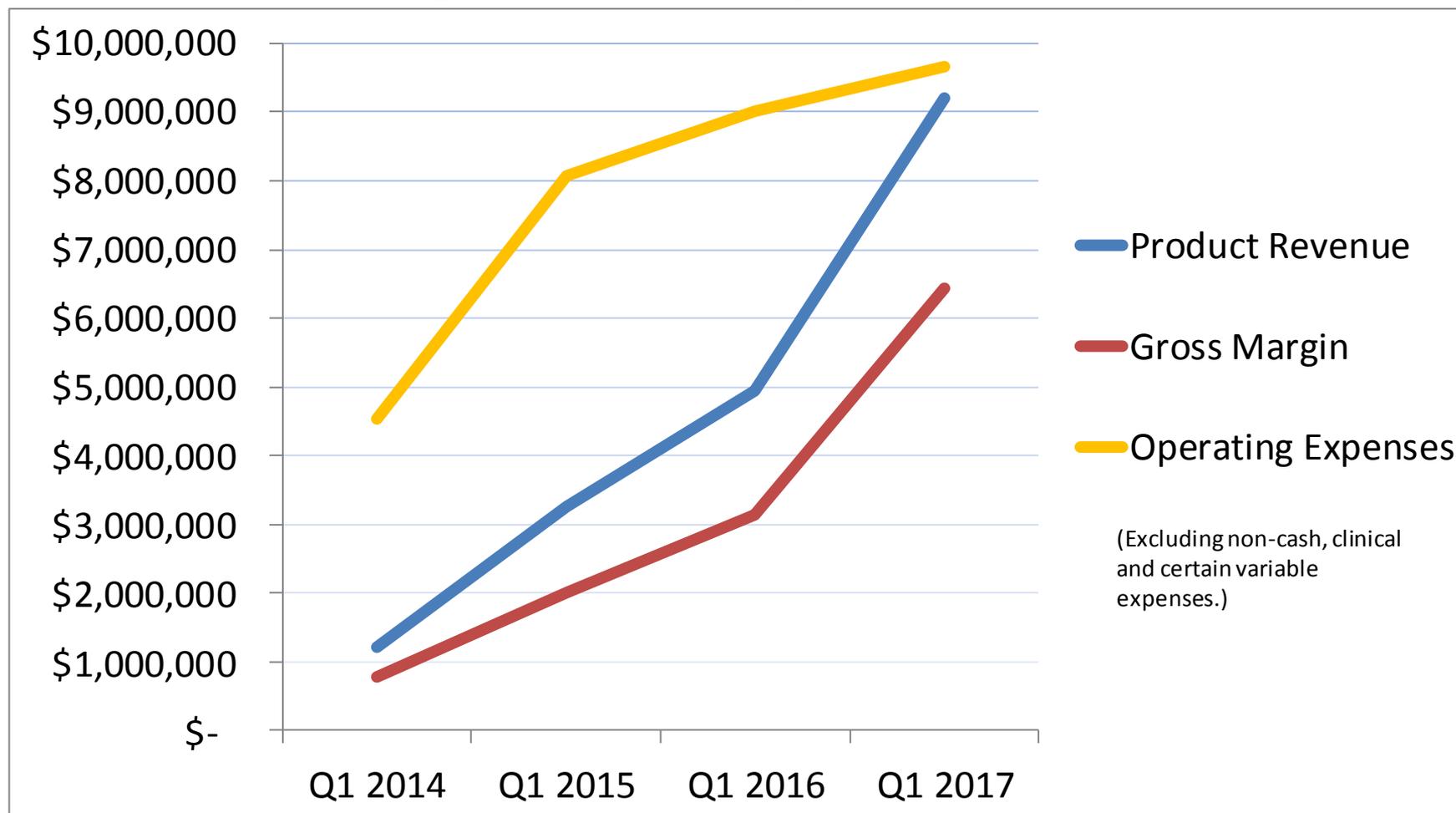


HVAC and Wiring

- Construction of new polymerization space underway
- Plant will be capable of supporting ~\$40M in sales, modification possible to extend it to ~\$80M
- Capital equipment on order, scheduled receipt Q3 2017, startup Q4 2017 and full commissioning Q1 2018

# Driving Toward Operating Breakeven

Trailing Twelve Months Key Performance Indicators



# CytoSorbents Investment Summary

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CytoSorbents is strongly positioned and on track  
to have our strongest year ever

- Established, well-run medtech, with the profile of a biotech, nearing critical mass
- Massive untapped \$20 billion critical care and cardiac surgery market
- Significant CytoSorb® sales growth and healthy 68% blended gross margins
- Operating profitability targeted during 2018
- Expansion of existing strategic partnerships and addition of new partners
- Expected start of CytoSorb® cardiac surgery trial in 2H 2017 to seek FDA approval
- High quality Investment banks and investor interest
- Greater market awareness and financing for success



# CytoSorbents™

HELPING REDUCE DEADLY UNCONTROLLED INFLAMMATION IN HOSPITALIZED PATIENTS WORLDWIDE

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# Financial Summary

<b>Basic Shares Outstanding</b>	28,108,555
<b>Fully Diluted Shares Outstanding</b>	32,877,189
<b>Share Price (6/8/17)</b>	\$4.00
<b>Market Cap (6/8/17)</b>	\$110.0M
<b>Cash &amp; Equivalents</b>	\$13.7M (pro forma 3/31/17)
<b>Total Debt</b>	\$5.0M (3/31/17) <i>\$5M additional draw available under Bridge Bank Facility</i>
<b>2016 Cash Burn</b>	(\$6.7M)