Sepset

TRANSFORMING THE FIGHT AGAINST SEPSIS

Robert Hancock OC, OBC, FRSC
Founder, CEO

Leading microbiologist and entrepreneurial scientist at University of British Columbia, Canada for 40 years.

Named 2nd best Microbiologist in world in 2024[1]

Top 0.05% of medical scientists worldwide[2]

Major role in translating University discoveries into new treatments and diagnostics. Co-founded 8 companies. 87 patents awarded.

Numerous Awards include US ICAAC Aventis Antimicrobial Research Award (leading award worldwide for antimicrobial research); Prix Galien for Pharmaceutical Research; Officer of the Order of Canada

[1] Research.com https://research.com/scientists-rankings/microbiology
[2] AD Scientific Index https://www.adscientificindex.com/

SEPSIS: ONE OF THE MOST SERIOUS PROBLEMS

https://www.worldsepsisday.org/sepsisfacts

49 million sepsis cases
Worldwide per year

#1 cause of death in hospitals

80%
of deaths could be prevented if treated in time

11 million deaths per year

#1 cause of hospital readmissions

100%
of all pandemic-related deaths (including COVID-19) are due to sepsis

1 in 5 deaths
Worldwide is associated with sepsis

#1 healthcare cost

Provides a major opportunity to improve human health and health care economics

SEPSET HAS THE SOLUTION

Sepset

A better technology for sepsis diagnosis:

Sepset^{ER} is the answer

Sepset^{ER} is a gene-based assay invented by Dr. Hancock and his team and patented by Asep Medical in the US, Europe & Australia

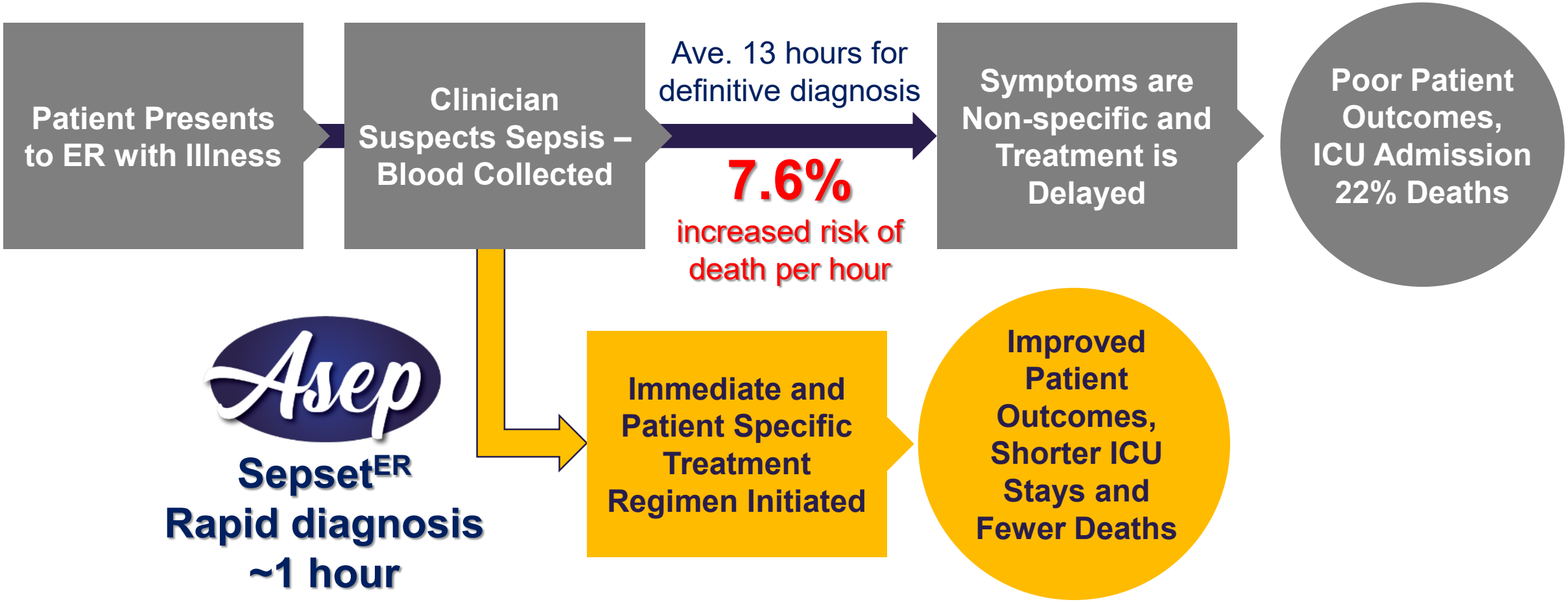
For use in the emergency room and early ICU

Easy to operate

Results in ~ 1 hour

The current diagnostic tests take between 15hrs and 3 days!

Sepset^{ER}, DRAMATICALLY SHORTENS THE TIME TO DIAGNOSIS OF SEPSIS → EARLIER TREATMENT



Groundbreaking Diagnostic Technology: Rapid sepsis diagnostic test delivers results in ~1hr after hospitalization, improving sepsis survival rates.

EXCELLENT PERFORMANCE OF Sepset^{ER} ON CLINICAL SAMPLES[1]

Sensitivity as high as 94%; Accuracy as high as 87%

Dataset	Patients	AUC	SENS	ACC
Hancock ICU (2 Cities)	176	0.90	92%	87%
Severe COVID-19 (Quebec)	359	0.85	85%	79%
Hancock ER (4 Countries)	338	0.69	70%	65%
Sepset^{ER} PCR test (Toronto)	248	0.88	94%	83%
Sepset^{ER} PCR test (China)	332	0.89	93%	78%

SENS = Accuracy of positive prediction of sepsis
ACC = Overall accuracy of predictions
AUC = Indicator of how well the test works for all patients

Test does not identify patients with severe cancer, IBD or heart disease

[1]Malic et al Nature Communications16:4442, 2025.

nature communications

Sepset

Article

https://doi.org/10.1038/s41467-025-59227-x

A machine learning and centrifugal microfluidics platform for bedside prediction of sepsis

Received: 11 October 2024

Accepted: 15 April 2025

Check for updates

Lidija Malic[1,2,3,10], Peter G. Y. Zhang[4,10], Pamela J. Plant[5,10], Liviu Clime[1], Christina Nassif[1], Dillon Da Fonte[1], Evan E. Haney[4], Byeong-Ui Moon[1], Victor Sit[1], Daniel Brassard[1], Maxence Mounier[1], Eryn Churcher[5], James T. Tsoporis[5], Reza Falsafi[6], Manjeet Bains[6], Andrew Baker[5], Uriel Trahtemberg[5,7,8], Ljuboje Lukic[1], John C. Marshall[5], Matthias Geissler[1], Robert E. W. Hancock[4,6], Teodor Veres[1,2,9] & Claudia C. dos Santos[2,4]

Prediction accuracy (~90% in early intensive care unit (ICU) and 70% in emergency room patients) is validated in 3178 patients from existing independent cohorts. A RT-PCR-based Sepset detection test shows a 94% sensitivity in 248 patients to predict worsening of the sequential organ failure assessment scores within the first 24 h

← From the abstract

Sepset^{ER} OUTPERFORMS OTHER SIGNATURES ON CLINICAL SAMPLES

Signature*	Mean AUC N=3178	Davenport ICU N=371	Cancer Negative Control N=1755
Sepset^{ER} n6	0.88	0.83	0.50
SeptiCyte Rapid n2	0.61	0.60	0.39

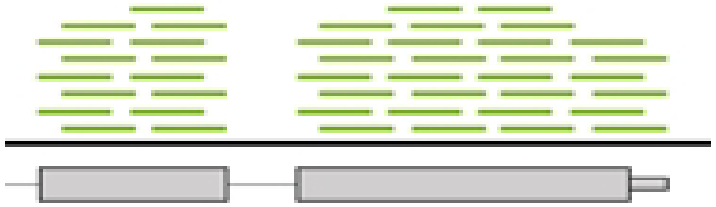
* Company analysis based on Sepset^{ER} and published SeptiCyte signature

Inflammatix Triverity Illness Severity Group	Number in each group (band)	Actual number (%) with Severe Illness
Very High	31 (2.5%)	18 (58%)
High	180 (14.7%)	41 (23%)
Moderate	229 (18.7%)	38 (17%)
Low	303 (24.7%)	15 (5%)
Very Low	377 (30.9%)	10 (3%)

Extract from Table 17 – FDA K241676; https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm?ID=K241676

A.I. DROVE SEPSET DISCOVERIES

Diagnosing sepsis in a timely fashion to speed the medical response (Sepset^{ER})

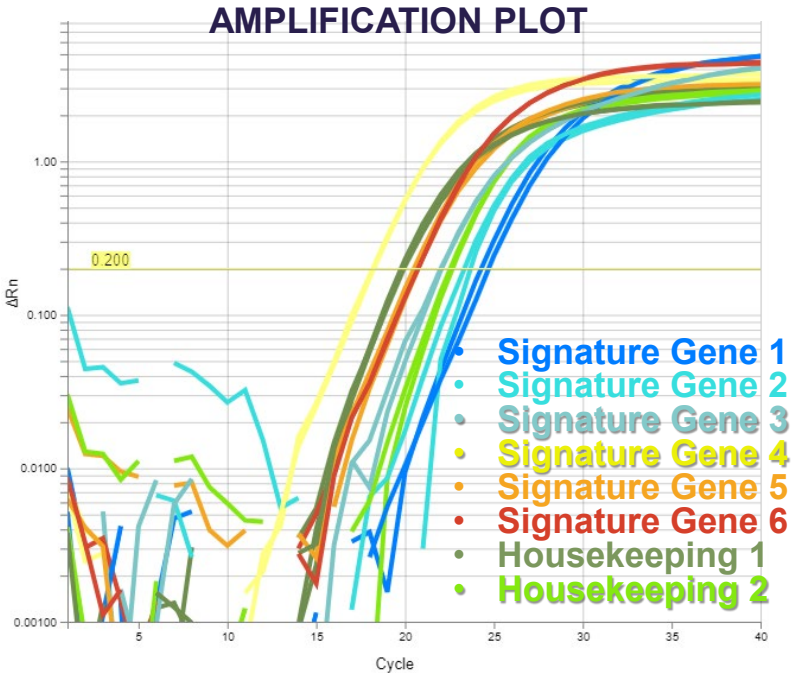


572 patients → Blood
RNA-Seq
11,000 genes expressed

LASSO
AI

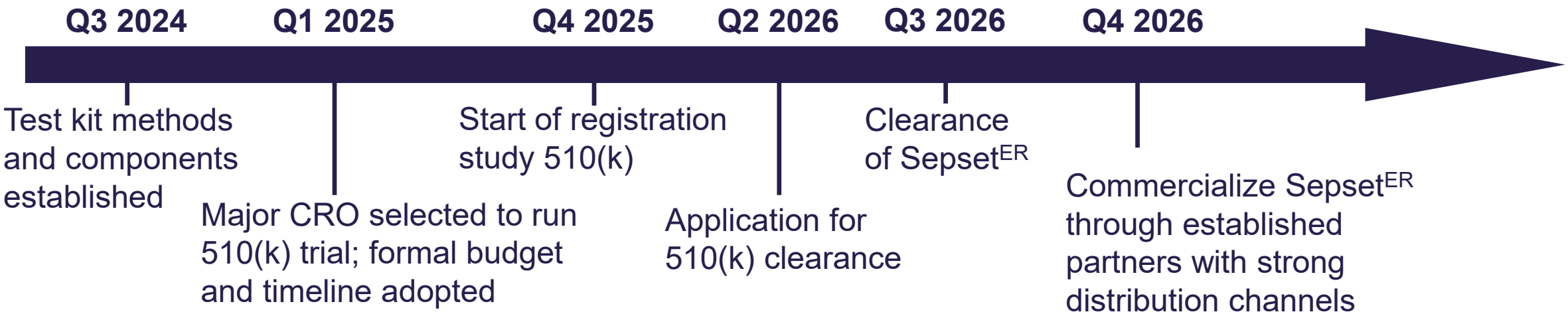
Sepset^{ER} signature accurately diagnoses sepsis and organ failure in 1 hour

XGBoost AI

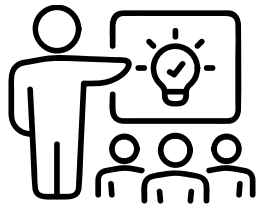


Sepset^{ER}, COMMERCIALIZATION PATH IN NORTH AMERICA

Test accurately assesses high risk of sepsis within 24 hours in 9 of 10 patients (Based on clinical data from >3,000 patients; >500 using test kit parameters).



SEPSET PRODUCTS ADDRESS BILLION DOLLAR MARKETS



Sepset

$1.3B Global Sepsis Diagnostic Market by 2030; CAGR: 9.7%

https://www.grandviewresearch.com/industry-analysis/sepsis-diagnostics-market

Estimated cost savings in the USA, per year:

>$3.0 million

per hospital

>$16.6 billion

in total

RTI (h)(s) Health Solutions

A massive business opportunity. Hospitals, payors and patients are suffering and it's getting worse - healthcare executives are charged with controlling costs

ACCELERATED PRODUCT ADOPTION AND DISTRIBUTION

- **Goal**. Better clinical solutions for sepsis, improved patient outcomes & reduced medical industry costs, while generating high returns on investor's capital.
- Bring Sepset^{ER} **to market in USA, India and China in 2026**.
- Maintain aggressive business development strategy through **Partnerships**
  - JVs with SeaSpring (Bahrain/Middle East); Sansure (SepSMART; China) Trial Dec 2025.
  - Technical partnership with Huwel Life Sciences (India) → Regulatory Clinical Trial
- **Broad patent protection** (19 issued to date) to protect IP.
- Currently employ a **virtual business model** for product development.
  - Contracts with leading Universities access world leading researchers and equipment;
  - Low overheads 40% cf. industry standard 200%.
  - Engaging leading CROs to enable clinical goals

INVESTMENT HIGHLIGHTS

Novel Technologies

In the early diagnosis of sepsis and underlying endotypes

Large Addressable Global Markets

With No efficient clinical solutions (unmet medical needs)

Extensive Intellectual Property

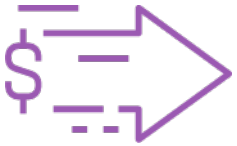
Portfolio in Diagnostics

Experienced Management Team

Proven track records in med-tech and biopharma

Optimized Business Model to Deliver Shareholder Value

Partner early and often



Seeking Funding to Commercialize Initial Product

Focus on Sepset^{ER}

ABT Innovations

TRANSFORMING THE FIGHT AGAINST ANTIMICROBIAL RESISTANCE (AMR)

Named 2nd best Microbiologist in the world in 2023 by Research.com

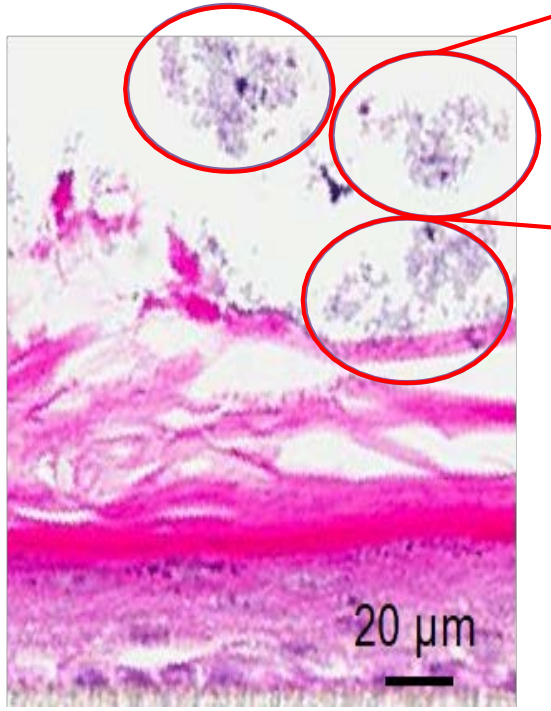
https://research.com/scientists-rankings/microbiology

Our Therapeutics address Biofilms: A distinct and important issue in AMR

ABT Innovations

Proprietary peptide technology directly addresses the ineffectiveness of current treatment options for biofilm-infections by targeting and suppressing biofilm growth while also reducing inflammation.

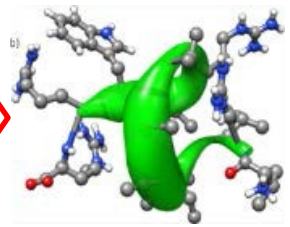
Human Skin Model



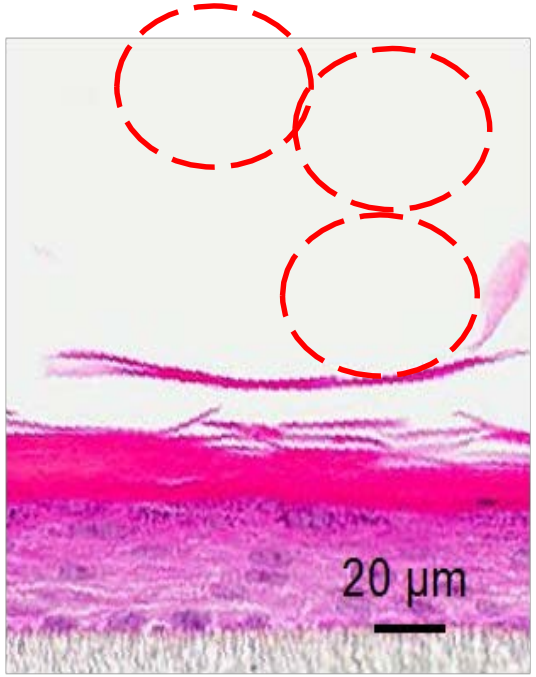
Biofilm

AI Aided Discovery

Asep Peptide



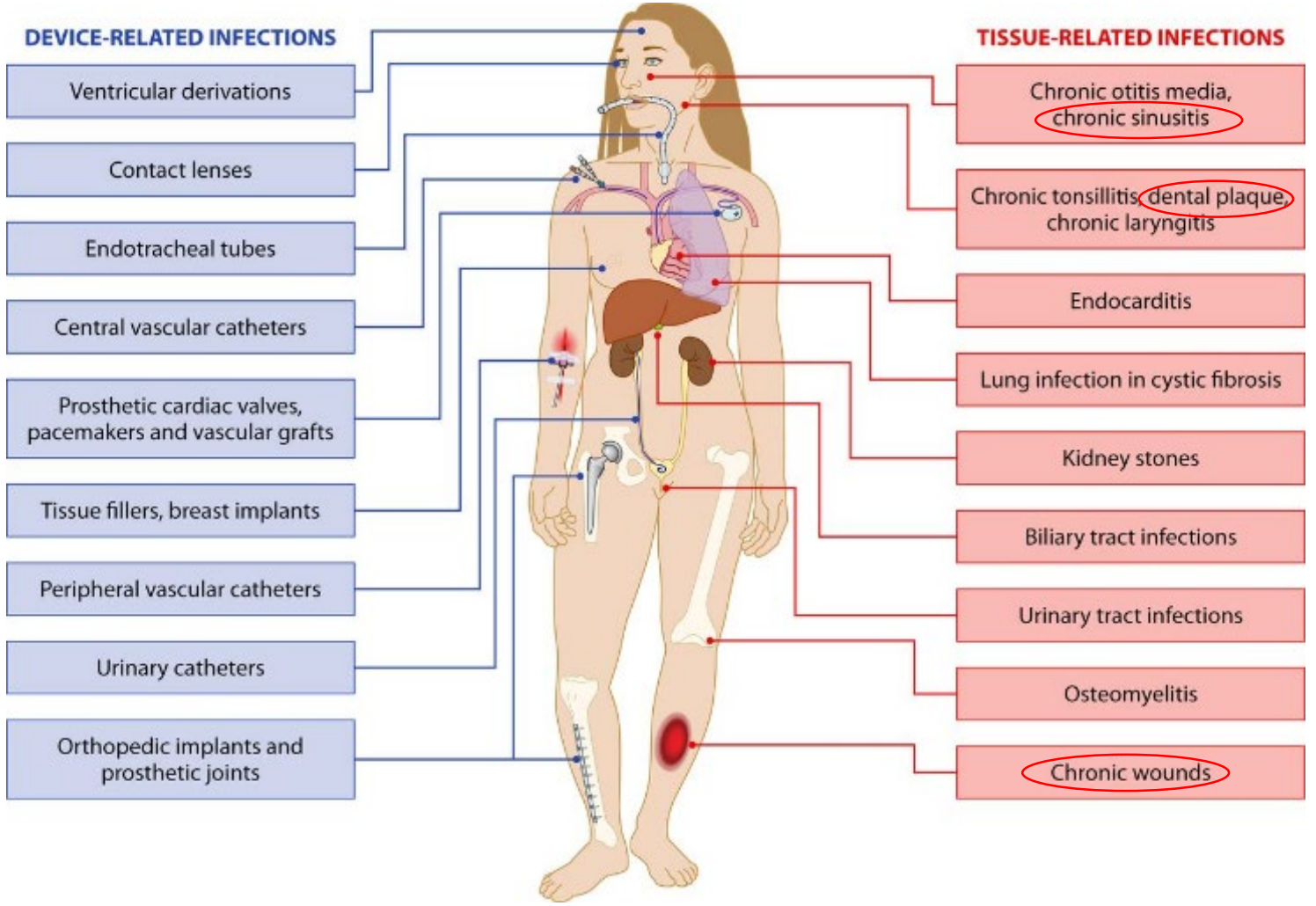
Biofilm killed Skin damage reversed



Bacterial biofilms and biofilm associated infections – A Major Unmet Medical Need

ABT Innovations

- Adaptively multidrug **resistance** (10-1000 X) to conventional antibiotics
- Clinically relevant - **>65% of all bacterial infections**
- Estimated **cost** to global healthcare of **$368 billion***
- **No biofilm specific therapies approved** for clinical use
- Many discrete opportunities addressing large unsatisfied markets



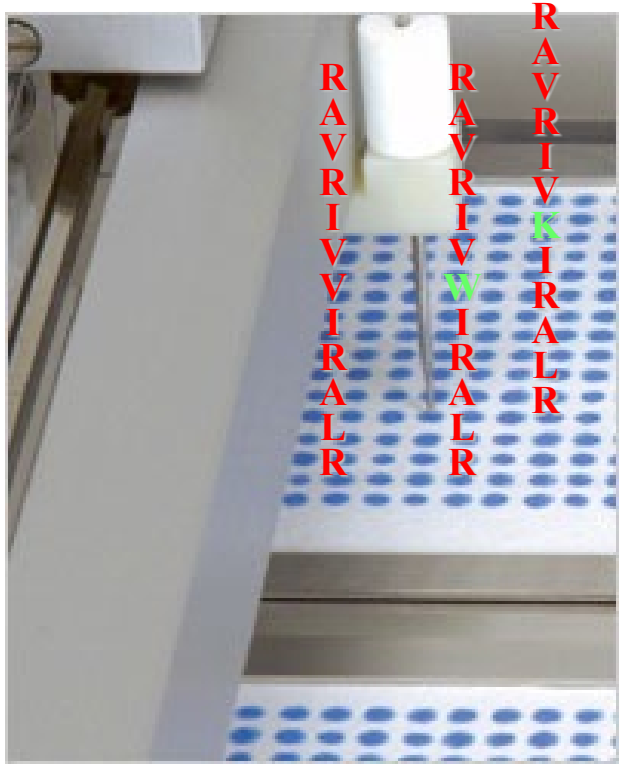
*Cámara et al. (2022) *npj Biofilms and Microbiomes*. 8:42.

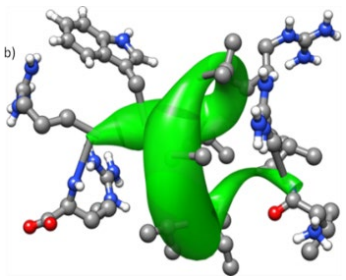
Lebeaux et al (2014) *Microbiol. Mol. Biol. Rev.* 78(3) 510-543

A.I. DRIVES ABT DISCOVERIES

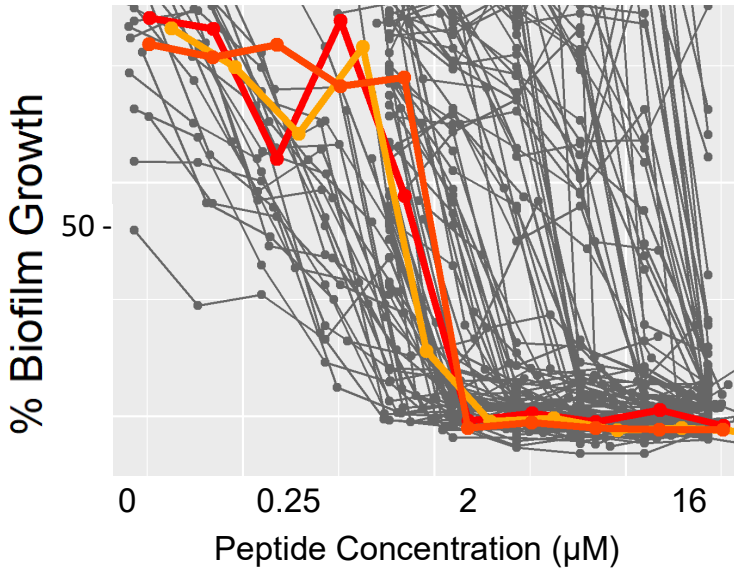
The problem: Finding the most active peptides

Thousands of antibiofilm peptides made





Neural Networks
VAE Autoencoder
ExAI



Therapeutic Target 1: Oral Biofilms

ABT Innovations

- Oral plaque is a polymicrobial biofilm that forms around teeth in the oral cavity
- Typically removed mechanically
- Also associated with dentures and dental implants
- Can contribute to infections in the oral cavity which cannot be treated with antibiotics
- Global market for oral health care is $33 Billion (2022)[1]
- Global market for oral rinses was $6.9 Billion and is expected to expand at a compound annual growth rate (CAGR) of 7.1% from 2022 to 2030.[2]

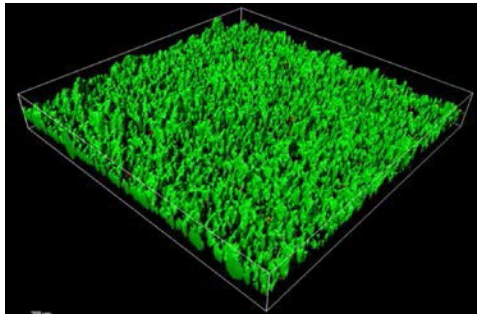
[1] https://www.globenewswire.com/news-release/2023/04/11/2644137/0/en/Oral-Care-Market-Size-Share-to-Surpass-51-37-Billion-by-2030-Vantage-Market-Research.html

[2]https://www.prnewswire.com/news-releases/oral-rinses-market-worth-us5-89-billion-by-2030-with-6-5-cagr--marketsandmarkets-302541875.html

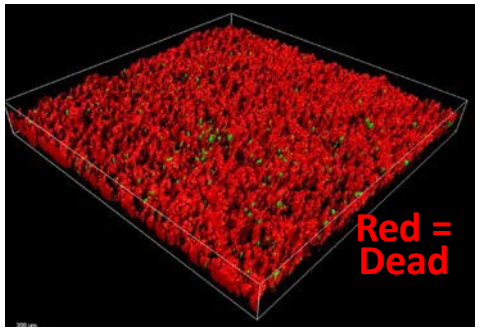
ABT Peptides destroy Complex Oral Biofilms on Hydroxyapatite

ABT Innovations

Confocal Microscopy



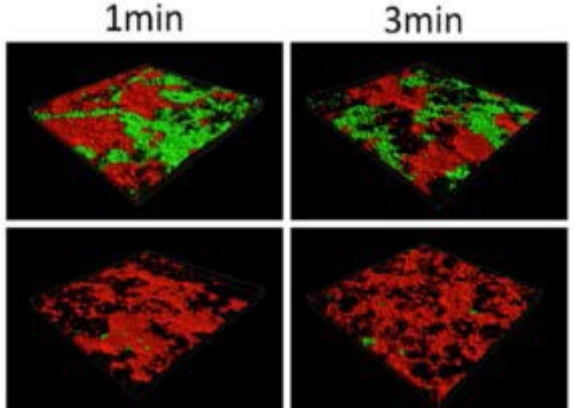
No peptide



10 µg/ml ABT18

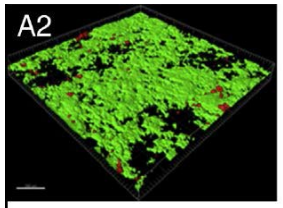
Wang, Z, et al. 2015. PLoS One 10, e0132512.
Zhang et al. 2016. PLoS One 11: e0166997;
Wang et al. 2018. J. Endodontics 44:1709-13

Peptides work rapidly & synergize with EDTA & Chlorhexidine →

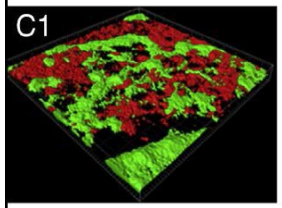


CHX + ABT18

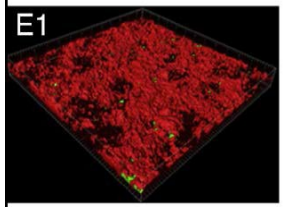
CHX + ABT5



Saline

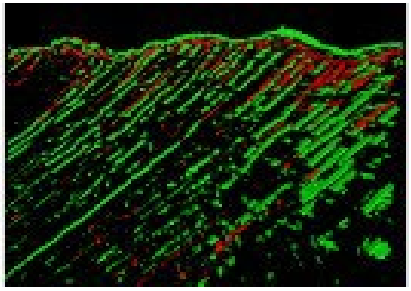


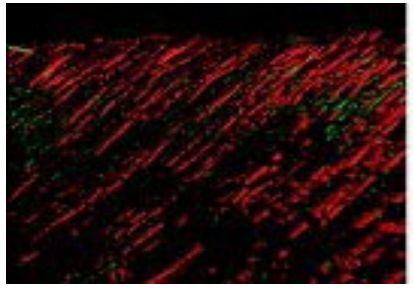
EDTA



EDTA + ABT5

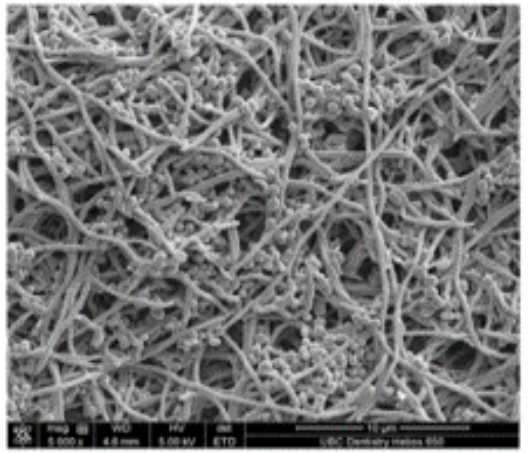
And work on dentin biofilms ↓



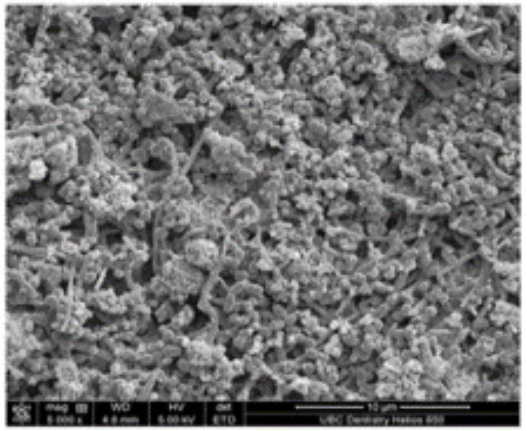


Scanning Electron Microscopy

Sterile water low mag

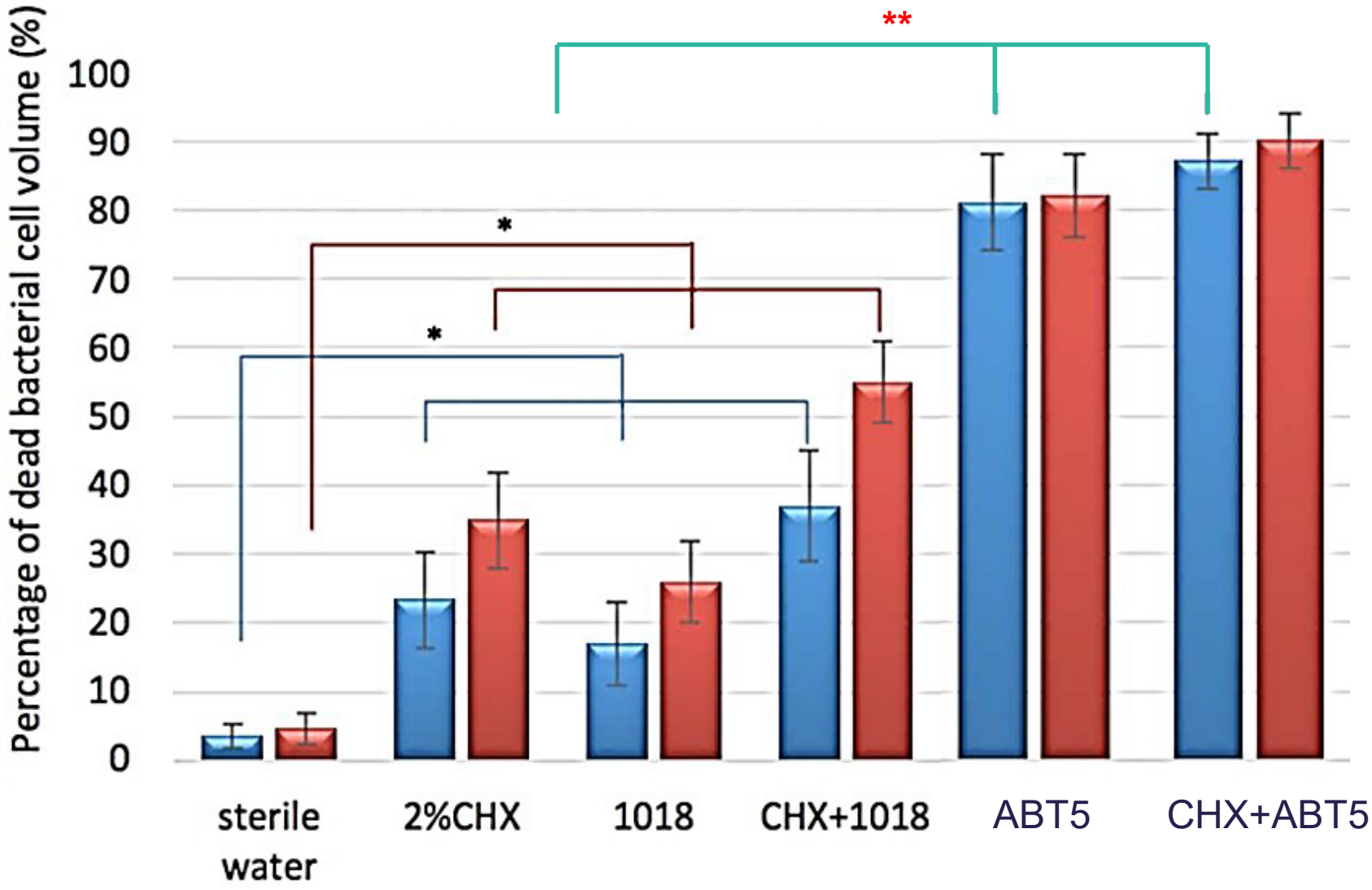


ABT18 Low mag



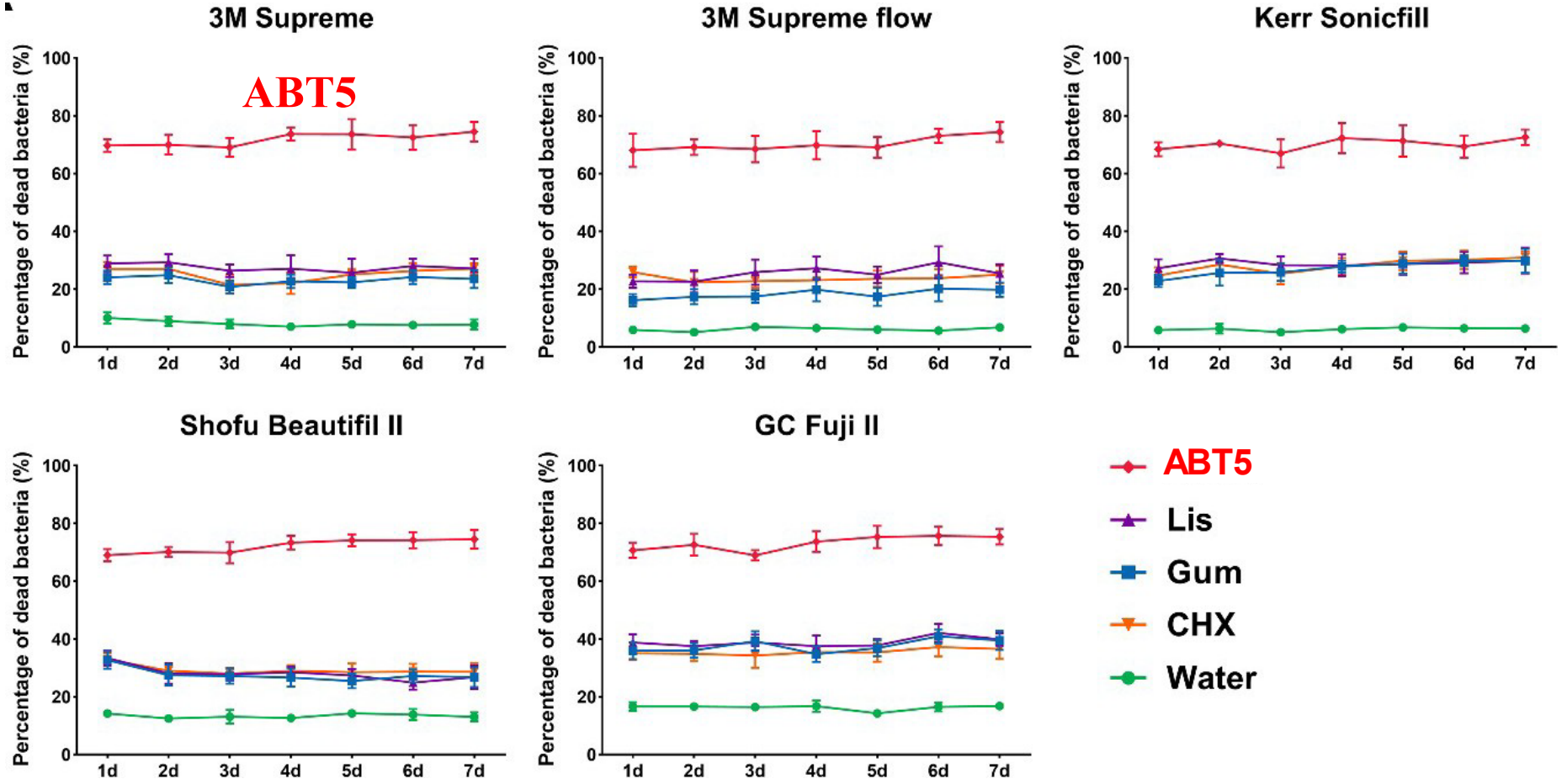
Short-term treatment with peptide is superior to oral disinfectant Chlorhexidine

ABT Innovations



Peptide is superior to Listerine and Paroex Gum (0.12% Chlorhexidine gluconate)

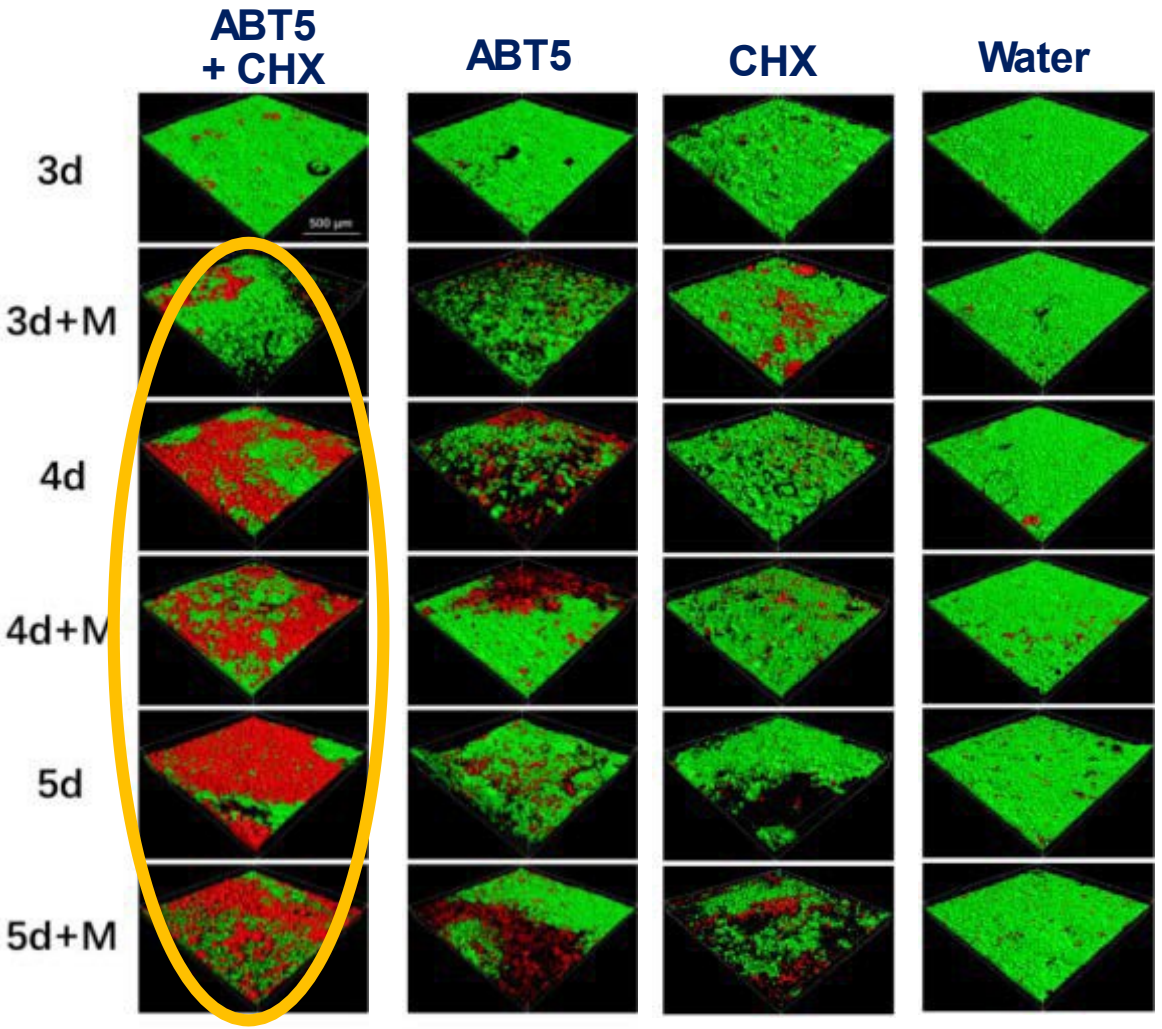
ABT Innovations



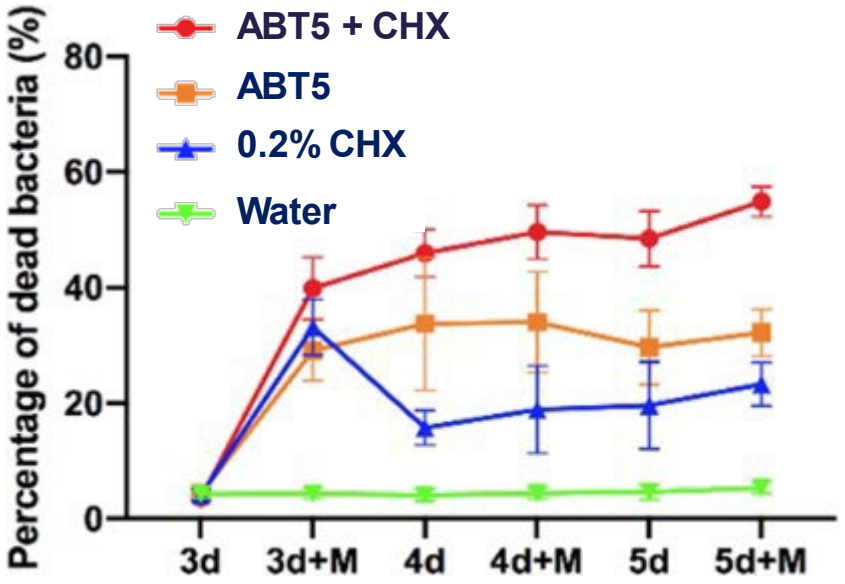
Dynamic antibiofilm effect on 1-week-old biofilm from a donor grown on dental materials. The proportion of dead bacterial cells after 7 days of different treatments (water, Paroex Gum, Listerine (LIS), CHX and ABT5) on discs of different dental materials (3M Supreme, 3M Supreme flow, Kerr Sonicfill, Shofu Beautiful II and GC Fuji II).

In Human Volunteers, Peptide + Chlorhexidine Combination is superior as an Oral Rinse

ABT Innovations



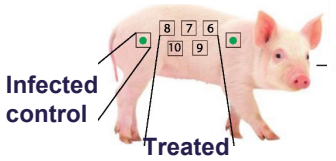
Confocal microscopy of biofilms grown in the oral cavity of three human volunteers. Biofilms were treated with peptide (ABT5), Chlorhexidine (CHX), or both in combination, or water. **Live cells appear green** while **Dead cells appear red**.



In collaboration with Dr. Ya Shen, UBC Dentistry, In preparation

ABT peptides address many bacterial biofilm associated infections

ABT Innovations

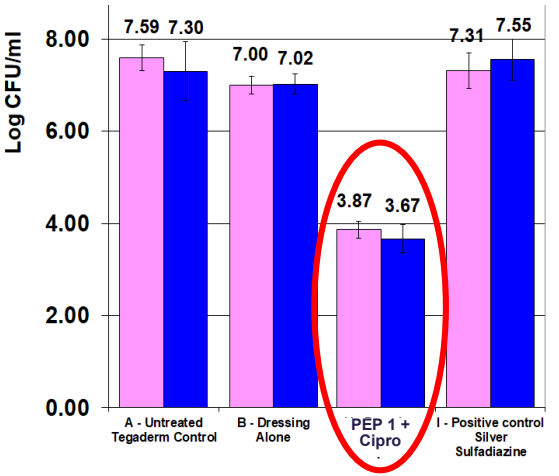


Targets

Next: Infected Wounds (Global Wound Care Market $20B, CAGR: 4.1%). Serious wound infections often become contaminated by bacterial biofilms → prevent healing. Asep peptides work in surgical and burn dressings. US Army interest.

Kill biofilms in human skin, mouse abscess and pig models.

Superior to standards: Fusidic Acid, Mupirocin & Silver nitrate.



Broad Spectrum Activity, e.g. vs. *Pseudomonas*

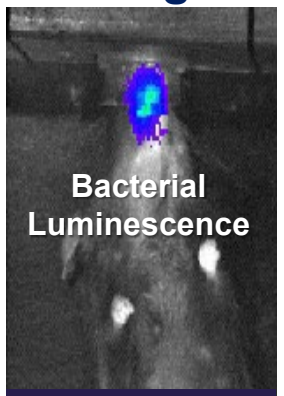
Future: Chronic Rhinosinusitis (Global Sinusitis market $2.6B, CAGR 7.3%). Lifelong condition causing painful inflammation due to bacterial biofilm infection. ~4 million doctor visits in US/year.

Most common treatment is surgical removal of infected tissue (500,000/year) plus antibiotics that do not work - poor activity vs. Biofilms. Mab drugs targeting inflammation cost $10,000-$50,000, but poor evidence of efficacy (19-35%)

Asep peptides work in animal models of sinusitis

For details see Supplemental Materials (Market data from Markets and Markets)

Imaged 5 Days Post-Infection



Bacteria NO Treatment → Sinus Infection

Peptide Treatment Anti-biofilm Effect

Peptide use in Oral Rinses

ABT Innovations

- Peptides were very effective against oral biofilms when used alone or combined with chlorhexidine and can be used as an oral rinse.
- Peptides had a 3-fold stronger antibacterial effect than traditional oral rinses and killed significantly more biofilm microbes.
- Peptides reduce the levels of oral pathogens while maintaining the overall stability of the oral bacteria flora; even 3-week-old biofilms.
- OHP has developed an Oral Rinse/Irrigant based on the OHP Peptide IP.
- Have license and production partnership with Bondent for Chinese market. Launch predicted October 2026

Other Indications

ABT has data for each of these indications

Prevention of …

- Caries
- Periodontal Infections
- Endodontic Infections
- Dental Implant Infections
- Dental Pulp Regeneration
- Traumas
- Anatomical pathways (e.g. Invagination)
- etc…

Proceeds will be used to develop the Initial Therapeutic Product

2014 — Therapeutics Development — 2026

CAD $17 M of non-dilutive and dilutive funding	$10 M funding needed for each of oral irrigant and wound indications
• ABT peptides destroy oral biofilms; oral mouth-rinse developed. Tested in man. • ABT peptides have been incorporated into surgical and burn dressings; Work better than current agents in human skin, mouse abscess and pig wound models ± antibiotics • ABT peptides reduce biofilm infections and inflammation in animal models of sinusitis	• Finalize partnerships for commercialization • Oral irrigant study for safety leading to drive to obtain registration in Europe/US • Finalize optimal combinations of ABT peptides plus antibiotics for wound care. Initiate 510(k) clearance studies for enhanced wound dressings

Asep Intellectual Property

ABT Innovations

Therapeutics

3 PATENT FAMILIES, 18 FILED PATENTS
8 AWARDED

Small Cationic Antimicrobial Peptides
8 Patents in US, Europe, Australia, etc.

Cationic peptides with immunomodulatory, and/or anti-biofilm activity
National entry process

Cationic Peptides with broad Spectrum Anti-Biofilm activity
Filed. PCT stage.

"Patents Are The Lifeblood of Biotechnology"

Biospace

Business Model – Global Market Opportunities, e.g. Oral Health

ABT Innovations

Business model is based on partnerships that will generate studies to support regulatory registrations where needed and go-to-market strategies for the Oral Rinse on a global basis.

1. An initial "Safety Study" by Dr. Ya Shen, UBC School of Dentistry. *In vitro* tox against red blood cells, peripheral blood mononuclear cells (PBMCs) and gingival fibroblasts revealed no significant toxic effect up to a conc^{n} of 200 µg/ml.
2. Following completion of the Safety Study, OHP will proceed with its partner in China, Bondent, to formulate and test an Oral Irrigant, followed by human clinical studies.
3. The Chinese study results should support regulatory filings outside of China, including a 510(k) trial with the FDA in the U.S.
4. ABT is in discussions with a leading medical device manufacturer and a distributor in India to manufacture and market the Oral Rinse in India. A smaller sample study of 300 to 400 participants will be conducted in India will support registration of the Oral Rinse in India.