



## Clinician

Ron Linden, MD, is the Founder, CEO and Medical Director of Ontario Wound Care and the Judy Dan Research & Treatment Centre and has specialized in hyperbaric medicine for over 20 years.



## Patient Condition

This patient presented with a diabetic foot ulcer on their left heel resulting from poorly controlled diabetes.

# Identifying Bacteria Through Red and Cyan Fluorescence with the MolecuLight *i:X*<sup>®</sup> Led to Optimized Sampling

This patient presented at the clinic with a deteriorating diabetic foot ulcer as a result of poorly controlled diabetes. At this stage, the clinician suspected contamination and infection with pathogenic bacteria. This was ultimately confirmed. An infection of a diabetic foot ulcer is a serious complication requiring immediate treatment. Accurate sampling to correctly identify the causative pathogens and their sensitivity or resistance to antibiotics can be critical to determining the appropriate treatment selection.

Polymicrobial wound infections by such pathogens as *Pseudomonas aeruginosa* and *Staphylococcus aureus* can be more virulent than single pathogen infections, resulting in worse patient outcomes<sup>1,2</sup>. Early detection of bacteria, through fluorescence imaging in combination with clinical signs and symptoms (CSS), can help to more quickly and accurately treat these wounds.

In this case study, the clinician used the MolecuLight *i:X* to assess this wound and fluorescence images (Figure 2) revealed both cyan and red fluorescence indicating the presence of *Pseudomonas aeruginosa* (cyan) and at least one other bacterial species (at  $>10^4$  CFU/g)<sup>3,4</sup>. Most bacteria fluoresce red when imaged with violet light using the MolecuLight *i:X* (e.g. *Staphylococcus aureus*), however *Pseudomonas aeruginosa* uniquely fluoresces cyan<sup>3,4</sup>.

In the absence of the MolecuLight *i:X*, the clinician indicated he would have swabbed the middle of this wound, however the fluorescence image (Figure 2) guided the clinician to sample both the red and cyan fluorescent regions, thereby increasing the likelihood of detecting multiple species.

Curettage samples confirmed the presence of *Pseudomonas aeruginosa* and *Staphylococcus aureus* in this wound.



Figure 1: Standard Image.

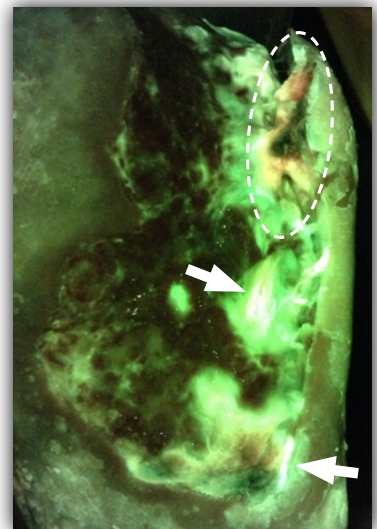


Figure 2: Fluorescence Image. The circle indicates red fluorescence which suggests the presence of a porphyrin producing bacteria<sup>3,4</sup>, in this case later confirmed as *S. aureus*. The arrows indicate areas of cyan fluorescence with glowing white centers, indicative of (and confirmed as) *P. aeruginosa*<sup>3,4</sup>.

## MolecuLight *i:X*<sup>®</sup>

The MolecuLight *i:X* allows clinicians to quickly, safely and easily identify wounds with bacteria<sup>3-6</sup> (at loads of  $>10^4$  CFU/g, in combination with CSS) and measure wounds<sup>4,6</sup> at the point of care to provide them with valuable information to inform treatment and monitor progress<sup>5,6</sup>.



### Testimonial

“Previously, I would have swabbed in the middle of the wound, getting results which would be positive for *Pseudomonas* but missing the *Staphylococcus aureus*. If you’re involved in wound care the MolecuLight *i:X* is an essential tool.”

— Ron Linden, MD

Visit [www.moleculight.com](http://www.moleculight.com)

+1.647.362.4684  
Toll Free 1.877.818.4360 (Canada)  
[info@moleculight.com](mailto:info@moleculight.com)

Follow us:  



#### References:

Images provided by Ron Linden, MD, Judy Dan Research & Treatment Centre, Toronto, ON, Canada MolecuLight Clinical Case 0044.

1. Pastar I *et al.* 2013. PLoS One 8:e56846.
2. Hendricks KJ *et al.* 2001. J. Bone Joint Surg. Am. 83-A:855–861.
3. Rennie MY *et al.* Understanding Real-Time Fluorescence Signals from Bacteria and Wound Tissues Observed with the MolecuLight *i:X*. Diagnostics (2019).
4. Raizman R *et al.* Use of a bacterial fluorescence imaging device: wound measurement, bacterial detection and targeted debridement. J Wound Care (2019).
5. DaCosta RS *et al.* Point-of-care autofluorescence imaging for real-time sampling and treatment guidance of bioburden in chronic wounds: first-in-human results. PLoS One (2015).
6. Cole W & Coe S. The Use of an Advanced Fluorescence Imaging System to Target Wound Debridement, Decrease Bioburden, Improve Healing Rates, and Provide Positive Revenues in an Outpatient Wound Care Setting. Presented at SAWC Fall 2019 (Las Vegas, NV, USA).

©2019 MolecuLight<sup>®</sup> Inc. All Rights Reserved. PN 1396 Rev 1.1

The MolecuLight<sup>®</sup> *i:X* Imaging Device is approved by Health Canada for sale in Canada and has CE marking for sale in the European Union. The MolecuLight<sup>®</sup> *i:X* Imaging Device has received FDA clearance.

MolecuLight<sup>®</sup> is a Registered Trademark in Canada, the US, and the EU.



Red and cyan/white color in this image indicates bacteria ( $>10^4$  CFU/g)<sup>3,4</sup>.