

# NEWS

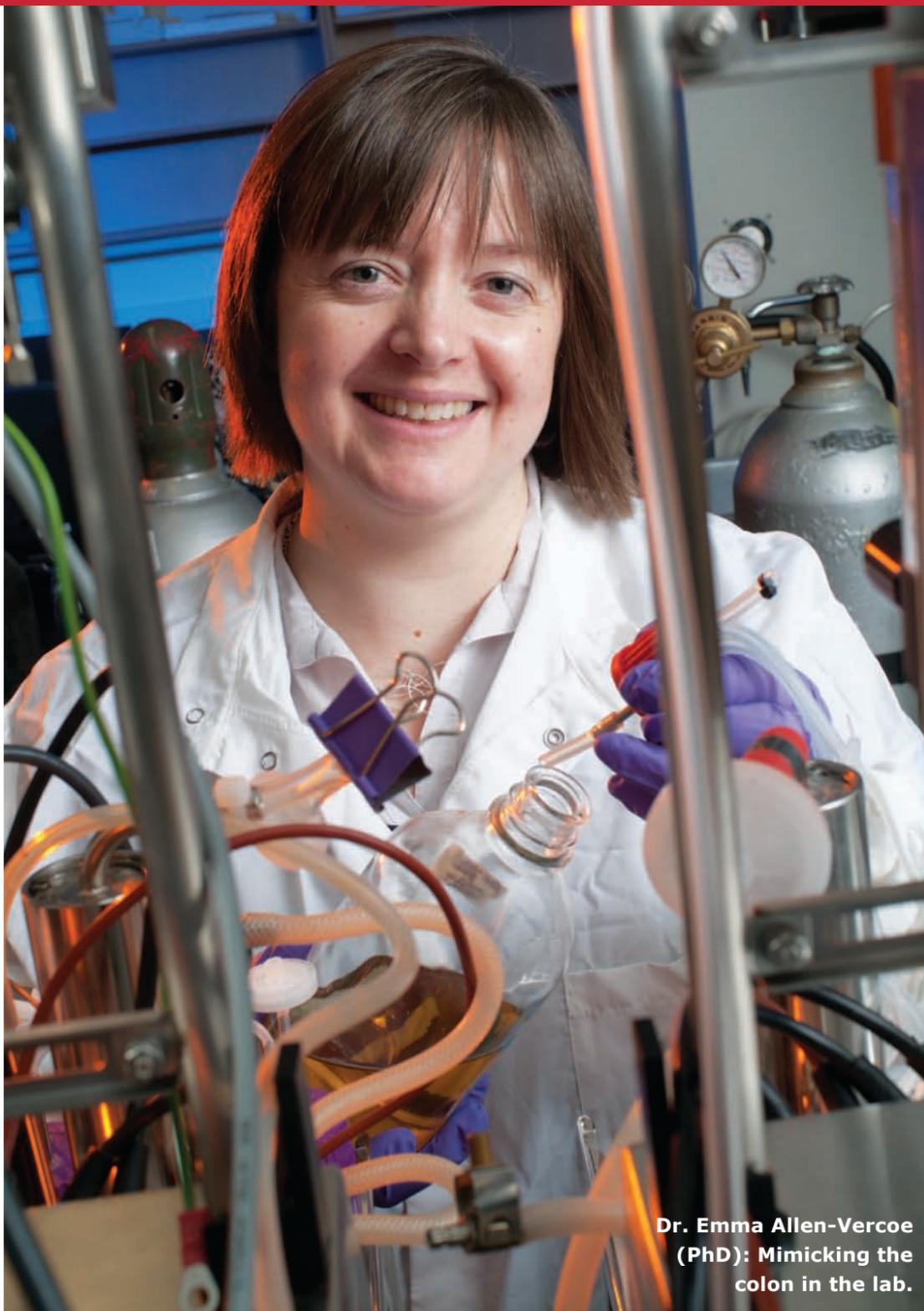
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CANADIAN DIGESTIVE DISEASES WEEK



Martin Schwalbe

Dr. Emma Allen-Vercoe (PhD): Mimicking the colon in the lab.

## Synthetic 'poop' cures C. diff

Treatment offers a less 'icky' approach than fecal transplant

BY SUSANNAH BENADY • Montreal

**A** prototype synthetic "super-poop"—a mixture based on human gut flora isolated from a healthy donor—has been developed as an alternative to actual poop for fecal transplantation.

Known as rePOOPulate, the preparation has already cured two patients with chronic *C. difficile* and has the potential to be produced on a national scale, providing a less "icky" form of treatment with a product of known composition

that is safer and more stable and can be used for retreatment in case of relapse.

rePOOPulate also has potential applications for major conditions such as inflammatory bowel disease, obesity and even autism, through its ability to rebalance a patient's abnormal gut microbial ecosystem.

As such, it is part of a new paradigm in medicine, Dr. Emma Allen-Vercoe (PhD), an assistant professor of microbiology at the University of Guelph in Ontario, told the Canadian Digestive ↻

Diseases Week conference.

Dr. Allen-Vercoe devised and developed the concept in conjunction with Kingston General Hospital infectious disease specialist Dr. Elaine Petrof, who has performed fecal transplants and was impressed with their success in curing *C. difficile*.

But, she said, she was looking for something safer and more palatable for patients.

“There is no doubt that fecal



**Dr. Allen-Vercoe and colleagues use Robogut, the laboratory setup that simulates the environment of the colon, to grow bacteria for rePOOPulate, a chronic *C. difficile* cure based on gut flora from a healthy donor.**

transplant works—it is highly successful. In fact, we did not have a single treatment failure. But, to tell the truth, fecal transplant is extremely primitive,” said Dr. Petrof, also an assistant professor of medicine in the department of infectious diseases at Queen’s University.

Dr. Allen-Vercoe developed RePOOPulate using her lab’s home-built Robogut, a system of six glass vessels, computer controlled to maintain a con-

stant supply of nutrients, a temperature of 37 degrees and a pH of seven, so it mimics the human distal gut.

The rePOOPulate itself was composed of 33 strains that showed favourable antimicrobial sensitivity, isolated from the stool of a supremely healthy individual, and was administered to the patients through a colonoscope.

“These strains are difficult to culture because the majority are strict anaerobes,” explained Dr. Allen-Vercoe. “But with the Robogut, we are able to mimic the human gut and we get the strains growing in communities in a nutrient-rich, anaerobic medium, and we have managed to produce an entire ecosystem that can colonize and persist.

“This makes it a better treatment than more traditional probiotics, which do not persist and have to be given continually. It is also safer than the traditional stool transplant, which can be risky because even though the stool is screened for known pathogens, there is the potential for it to contain unknown pathogens, which could be a risk for future disease.”

The two patients treated had both developed *C. difficile* after receiving antibiotics, one as prophylaxis for elective surgery, the other for a series of soft tissue infections.

Both then received at least four courses of metronidazole and vancomycin but this failed to eradicate the *C. difficile*.

After just one administration of rePOOPulate, both patients were asymptomatic within three days, tested negative for *C. difficile* and have remained symptom-free six months later—in spite of both in the meantime being prescribed antibiotics several times by their GPs for other minor infections.

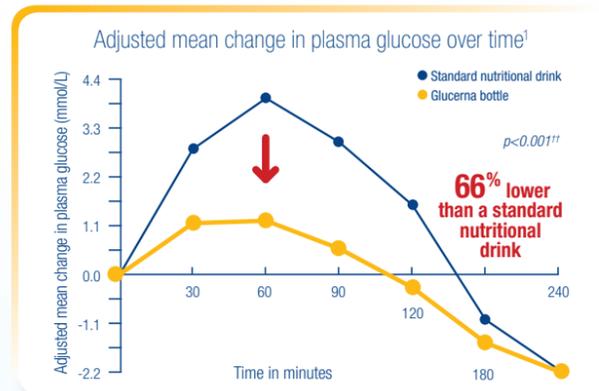
“We have come up with a mixture that has a ‘microbial community’ robustness, which seems able to withstand these hits from these other antibiotics,” said Dr. Petrof.

“This is very exciting for us.”

Sequencing of the patients’ gut flora showed that after treatment they had a composite of the rePOOPulate and their original bacteria. “The intestinal microbial profile of the patients reverts to features of the synthetic stool, showing that the beneficial effects persist,” said Dr. Petrof. **MP**

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References:

1. J.A. Williams, J. Garcia Almeida, M. Matia Martin *et al.* Lack of Glycemic Response at 120 minutes postprandial with a New Diabetes Specific Nutritional Formula (Abstract). *Clinical Nutrition Supplements*. Sept 2009; 4(S2). LB003. 2. Study BK20, Data on File, Abbott Laboratories, Limited. 3. Canadian Diabetes Association 2008. Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. *Canadian Journal of Diabetes Care*; 32 (Suppl. 1) S40-45.

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