A new approach to treating bacterial infections without antibiotics - targeting the disease response rather than the bacteria

New molecular concepts for the treatment of bacterial infections were presented at the National Infection Biology meeting, held on October 20-21. Scientists collaborating with Hamlet BioPharma AB, the pharmaceutical company specializing in the development of drugs for cancer and infections, have developed several drug candidates and demonstrated their potent treatment effects. The discoveries suggest a transformative shift in infectious disease management, built on the discovery of molecules that target the disease response of the host rather than the pathogen itself.

Targeting the disease, not the bacteria
The discoveries come from Hamlet BioPharma's long-term collaboration with Lund University and Linnane Pharma and the extensive analysis of infectious disease mechanisms, using advanced technology, animal models and clinical studies. By defining why the acute immune response becomes unbalanced and destructive in infected tissues, molecules can be designed to target these processes. Treatment then reduces harmful inflammation and boosts the body's natural defenses, so that the bacteria can be eliminated.

Four identified candidate molecules were presented
At the symposium, four candidate molecules were presented, three of which are in Hamlet BioPharma's pipeline. Each molecule works through a distinct yet complementary way of balancing and modulating the immune response.

- ➔ NlpD - a protein from ''nice'' bacteria that enters human cells and blocks disease gene activity (RNA Polymerase II inhibitor)– Hamlet BioPharma
  A bacterial inhibitor affecting transcriptional control and limiting inflammation-driven damage in the infected host.
- ➔ IRF7 siRNA – a regulator of severe kidney infection that may become damaging and needs to be inhibited – Hamlet BioPharma

siRNA inhibition balances the exaggerated immune response in kidney infection (cytokine storm), reducing inflammation and helping the body clear the bacteria.

- ➔ Lon –a protein that targets MYC in human cells and slows down immune overactivity (cytokine storm) – Linnane Pharma
  A bacterial protein that targets MYC; one of the most important regulators of human tissue function. Lon inhibits MYC, reduces harmful inflammation and restores the antibacterial defense.
- ➔ IL-1RA – calms hyper-inflammation by blocking key immune messengers – Hamlet BioPharma
  A molecule that blocks excessive inflammation by inhibiting IL-1α and IL-1β. Therapeutic efficacy demonstrated in a Phase II clinical study, where IL-1RA reduced symptoms and recurrence rates and increased the quality of life.

All four molecules work by treating the infection itself rather than just killing bacteria. They help the body's own defenses clear the infection without antibiotics, control immune activity for lasting benefit, and remain effective even when bacteria are resistant to antibiotics.

"These molecules show that we can treat infections by restoring immune balance, not just by killing bacteria. It's a new way to fight infection and reduce antibiotic use", comments Catharina Svanborg, CEO Hamlet BioPharma.

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