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Methods and Reagents to Label Bacteria and Virus and Identify their Interacting Proteins

A novel chemical probe is available to universally map pathogen entry pathways and identify drug targets by isolating host protein interactions with infectious bacteria and viruses.

Purdue researchers have developed a chemical probe to facilitate quantitative proteomic analysis of potential drug targets for infectious diseases, identifying interactions between infectious particles and host proteins. Pathogens rely on their host's cells to proliferate and must bind to host cellular components. The weak and often transient nature of these interactions make capturing these interactions difficult due to harsh measures available to isolate such interactions. To aid in mitigating the high false positive rate brought about by these contemporary methods, Purdue researchers have synthesized chemical probes to label bacteria or virus particles that crosslink with interacting host proteins during infection. The probe contains a modifiable isolation tag to allow for identification of host proteins through mass spectrometry. The researchers have demonstrated this technology by isolating host proteins that directly interact with Salmonella and Zika virus, which might be critical for their pathogenesis. This method could serve as a universal tool to map the entry pathway of other pathogens.

Related Publication:

Tracking Pathogen Infections by Time-Resolved Chemical Proteomics

Angewandte Chemie, Feb 2020, Vol.132(6), pp.2255-2260

DOI: 10.1002/anie.201911078

Advantages:

-Able to identify previously unknown protein interactions

-High throughput

Technology ID

2019-TAO-68397

Category

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

Pharmaceuticals/Research Tools & Assays

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Potential Applications:

-Drug development

-Viral and bacterial pathogenesis research

TRL: 4

Intellectual Property:

Provisional-Patent, 2019-04-19, United States | Utility-Gov. Funding, 2020-04-17, United States

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