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Scientists find a way for making diagnostic tests more accurate

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Scientists at the University of Washington have discovered a simple way to raise the accuracy of diagnostic tests for medicine and common assays for laboratory research.

By adding polydopamine, a material that was first isolated from shellfish, to these tests at a key step the team could increase the sensitivity of these common bioassays by as many as 100 to 1,000 times.

Their approach is referred to as enzyme-accelerated signal enhancement, or EASE.

More sensitive tests would allow scientists to identify pathogens, diseases, and specific cellular proteins even when these "biomarkers" are present at levels far below the detection threshold of today's standardized tests. Initial results show polydopamine boosted the accuracy and resolution of these tests for biomarkers of HIV, Zika virus and proteins on cancerous tumors.

EASE centers on the simple addition of two biochemical components, dopamine and horseradish peroxidase, or HRP, at a key step. HRP is a common protein enzyme used to speed up the rate of reactions in biomedical research.

The research team discovered that HRP can connect dopamine molecules together to form the polymer chain polydopamine. Polydopamine, in turn, accumulates on the surfaces of reaction vessels, such as small Petri dishes. Once the polydopamine is present, scientists can continue the traditional steps of their protocols, but now with a substantially increased test sensitivity.

The team hopes that this simple modification will mean that scientists and medical professionals can easily incorporate EASE into their common practices and procedures.