

Developing a troponin assay that can distinguish between type 1 and type 2 myocardial infarction

Cardiac troponin is the gold standard biochemical marker for myocardial infarction. The presence of cardiac troponin in the blood indicates recent damage to the heart. Unfortunately, its presence provides no information about the cause of the damage. We are developing modified ELISA assays to determine if changes in the structure of troponin can provide additional clinical information.

Myocardial infarction is caused by ischemia, a lack of blood and oxygen. A classic "heart attack" is a type 1 myocardial infarction. Over time, the coronary arteries supplying blood to the heart become narrowed by atherosclerotic plaques. An acute plaque rupture precipitates blood clot formation, causing an abrupt loss of blood supplying an area of heart muscle. A type 1 MI is treated by procedures to bypass the clot as well as anti-clotting medications, which carry a significant bleeding risk. In contrast, a type 2 MI is caused by a supply-demand imbalance, due either to decreased blood supply to the heart (for example, due to low blood volume or hypotension) or increased strain on the heart (for example, increased cardiac output in the setting of septic shock).

We will be testing our modified troponin ELISA tests on blood samples obtained from patients with established type 1 or 2 MI to determine if we can detect a difference.

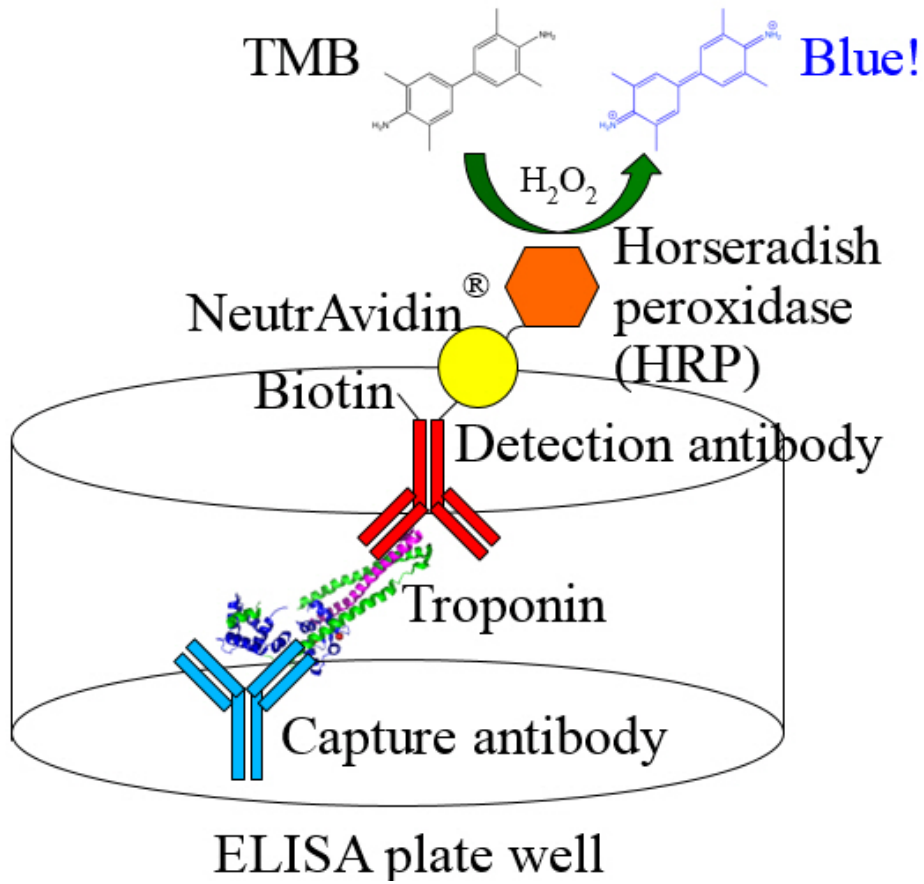


Figure 1. Sandwich ELISA assay.