Acute coronary syndrome (ACS) refers to a group of clinical symptoms and signs compatible with acute myocardial ischemia and includes unstable angina, non-ST-segment elevation and ST-segment elevation myocardial infarction (Kumar and Cannon, 2009). These high-risk manifestations of coronary atherosclerosis are important causes of the use of emergency medical care and hospitalization in the United States (Fig 1) and also in Brazil (Fig 2).

The high incidence of death in ACS patients is deeply related to its late diagnosis. Atherosclerotic plaque formation and its development releases several substances in the patient's blood that have a big potential to be explored as possible biomarkers for diagnosis of ACS, and several of such biomarkers associated with acute myocardial infarction have already been described.

**A Challenging Problem**

**Our Design**

**Our Biomarkers**

**TRIMETHYLAMINE N-OXIDE (TMAO) originates from the degradation of choline, present in the phosphatidylcholine (lecithin) from foods. Choline and other trimethylamine-containing species are degraded by gut flora, forming the gas trimethylamine (TMA) and trimethylamine N-oxide (TMAO). This molecule is then finally absorbed and metabolized in the liver by flavin-containing monooxygenase (FMO), associated recently with heart diseases such as ischemia-modified albumin (IMA).**

**Modeling**

**Perspectives**

- To incorporate more planned copies with Tor CAD Bba_K1086002 biobrick to decrease the time to detect TMAO and to detect less TMAO concentrations.
- To test our 2 constructs with ischemic and non-ischemic patient sera.
- To test our 2 constructs with serum from obese and non-obese patients to predict the potential risk of cardiovascular events in these patients.