**Introduction**

Nowadays, aromatics pollution has become a world-wide concern. Wield the power of synthetic biology, Peking IGEM team has developed a biosensor toolkit to help monitoring aromatics in the environments. We first applied a bioinformatics method to select a promising collection of aromatics-sensing biosensors. We then applied these sensors to practical analysis of complex samples. Aiming at comprehensive detection, metabolite enzymes, functioning as Adaptors, were incorporated into our toolkit to further expand detection profiles. Furthermore, a genetic “Band-pass Filter” was rationally constructed to implement efficient semi-quantitative detection.

**Biosensors**

The core component of our biosensor toolkit is the collection of promising aromatics-responsive transcriptional regulators. An automated bioinformatics method was developed to mine potential regulator candidates from protein databases. Final candidates that serve our purposes best were manually determined for construction of biosensor.

**Adaptors**

Aromatics-metabolizing enzymes were gleaned from natural metabolic pathways and coupled with biosensor circuits to function as ‘Adaptors’ to detect aromatics into detectable chemicals.

**Multi-component Analysis**

Considering the complex aromatic components present in practical samples, it is important to confirm that the performance of a particular biosensor is NOT interfered by irrelevant aromatic compounds.

**Band-pass Filter**

A band-pass filter is a genetic device that responds only to a specific range of input concentration.

**Acknowledgement**