Genetically engineered plants could act as ‘biosensors’ of pollutants

The GLP aggregated and excerpted this blog/article to reflect the diversity of news, opinion and analysis.

Synthetically engineered biosensors, which can be designed to detect and signal the presence of specific small molecule compounds, have already unlocked many potential applications by harnessing bacterial cells such as *E. coli* to sense toxins or enable bioproduction of valuable commodities including fuel, plastics, and pharmaceuticals. . . .

But now, a team of researchers at the Wyss Institute for Biologically Inspired Engineering at Harvard University and Harvard Medical School (HMS) led by George Church, Ph.D., has developed a new method for engineering a broad range of biosensors to detect and signal virtually any desired molecule using living eukaryotic cells. Church, who is a Wyss Core Faculty member and the *Robert Winthrop Professor of Genetics* at HMS, and his team reported their findings in the journal *eLife*.

. . . .

Strikingly, the team successfully engineered *Arabidopsis* plants to act as multicellular botanical biosensors, containing a custom LBD [ligand binding domain] to recognize the drug digoxin and a luminescent signal protein to emit light when digoxin is “detected”. These *Arabidopsis* biosensors gave off fluorescence when the plants were exposed to digoxin, proving that whole organisms can visually light up to signal detection of an arbitrary molecule.

. . . .

“Biosensors that can tell you about their environment are extremely useful for a broad range of applications,” said Church. “You can imagine if they were used in agricultural plants, they can tell you about the condition of the soil, the presence of toxins or pests that are bothering them.”

Read full, original post: Sensing the future of living detectors and bioproduction