

GM yeast can replace poppies in producing opiates

Severe pain? Reach for the yeast. Genetically engineered yeasts can now efficiently produce a range of opiates, including morphine and oxycodone. With growing anxieties about supplies of opium poppies, it could be just what the doctor ordered.

Opiates are primarily used as painkillers and cough suppressants, and many of the most widely used opiates can be produced only from opium poppies (*Papaver somniferum*). Demand for these drugs is booming. But of the poppies farmed to supply these drugs, some 50 percent are grown on the Australian island of Tasmania, so poor growing seasons can affect availability.

As drug companies search for new places to grow poppies, Christina Smolke from Stanford University, California, and her colleagues have been looking at getting yeast to make these complex drugs from simple sugars.

Some opiates, like morphine, are made naturally by poppies. Others, like oxycodone, are produced by chemically altering one of the plant's natural alkaloid chemicals – in this case thebaine. Back in 2008, Smolke inserted a number of genes – including some from the opium poppy – into yeasts, and got them to turn simple sugar molecules into a complex precursor of opiates: salutaridine. Now, in her latest work, she has solved the other end of the pathway, engineering yeasts to take complex precursors like thebaine and synthesise the finished products, including oxycodone.

“This work gets us very close,” says Smolke. All that's left is to combine the two stages in one strain of yeast, and solve the last few steps: getting the yeast to turn salutaridine into thebaine, completing the pathway from sugar to opiate product.

Read the full, original story: [Modified yeast makes opiates for the first time](#)