

Could Plants be the Next Step for Vaccination?

by Ryan Ancelin

With the dawn of genetic manipulation, it seems plants are more useful than ever. It started with bigger tastier fruits and vegetables, then crop plants capable of faster growth in poor soils. Is the next step in easier, pain free vaccination?

Imagine if a vaccine could be administered in a form other than an injection or a pill. You would be able to sniff or rub the vaccine onto your skin. Multiple vaccines would no longer be necessary because a single vaccine could be used to achieve the same end.

At the University of Calgary Heritage Medical Research Centre, Dr. Tony Schryvers is looking at plant-derived oil particles to be used for this form of vaccination. While the research is still in the early stages, this approach has the potential to be a simple and inexpensive way to administer a complex vaccine into the body.

What might this mean for us? Our immune system responds to foreign particles such as bacteria. By introducing bacterial proteins associated with plant oil particles into our bodies, our immune system is able to recognize these proteins in the case of actual infection. This allows the body to generate the necessary response, making it less likely to exhibit the symptoms of the disease.

The oil particles from the plant can be used as a vehicle for carrying foreign proteins from harmful bacteria. Because specific strands of DNA encode specific proteins, the introduction of DNA from disease-causing organisms, like bacteria, into that of plant DNA will result in the production of bacterial proteins by the plant. In a system developed by his colleague, Dr. Maurice Moloney, the oil particle will be coated by proteins natural to the plant and those specific to the bacteria.

Because plant oil particles are easily purified, they could be injected, sniffed or rubbed into the skin. Dr. Schryvers suggests they may represent a more flexible and convenient method to vaccinate animals or people.

Plants have a lot of DNA and there isn't any real physical limitation to how many different segments of DNA could be introduced into a host. Therefore, the potential to formulate complex vaccines is significant. A single vaccine may protect a person against several disease-causing organisms.

However, "plant molecular biology isn't easy, the potential for transgenics (the addition of DNA from one species into that of another) is becoming more prevalent, but there is lots to be done," says Dr. Schryvers. If such a system of vaccination is to become a reality, additional support will be required to further develop the system.

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