

The Plant Molecular Farming (PMF) Kit

– a novel way to express proteins



Do you need to express a recombinant protein? If so, you have choices, from bacteria to yeast, insect cells and mammalian cells. But have you considered going green?

Plants have been used since the 1980s as expression platforms for recombinant proteins. There are many ways to do this, but this kit, developed and offered by the EU Horizon 2020 Pharma-Factory consortium, provides you with materials and instructions for “transient expression”, a method that anyone with research laboratory experience will be able to use. And you don’t need to have green thumbs!

Why might plant molecular farming work for you?

- This is a straightforward eukaryotic expression system which is simple and quick to use. Once your plants are ready, you can have your protein within 5 days.
- Plants add post-translational modifications, like mammalian cell systems.
- No need for sterile cell culture.
- Recombinant proteins behave differently in different platforms. If you have difficulty with a protein, try plants.
- It is a greener alternative! Fewer plastic consumables, no gases required, and less energy required, just some light.

The kit works in two parallel stages.

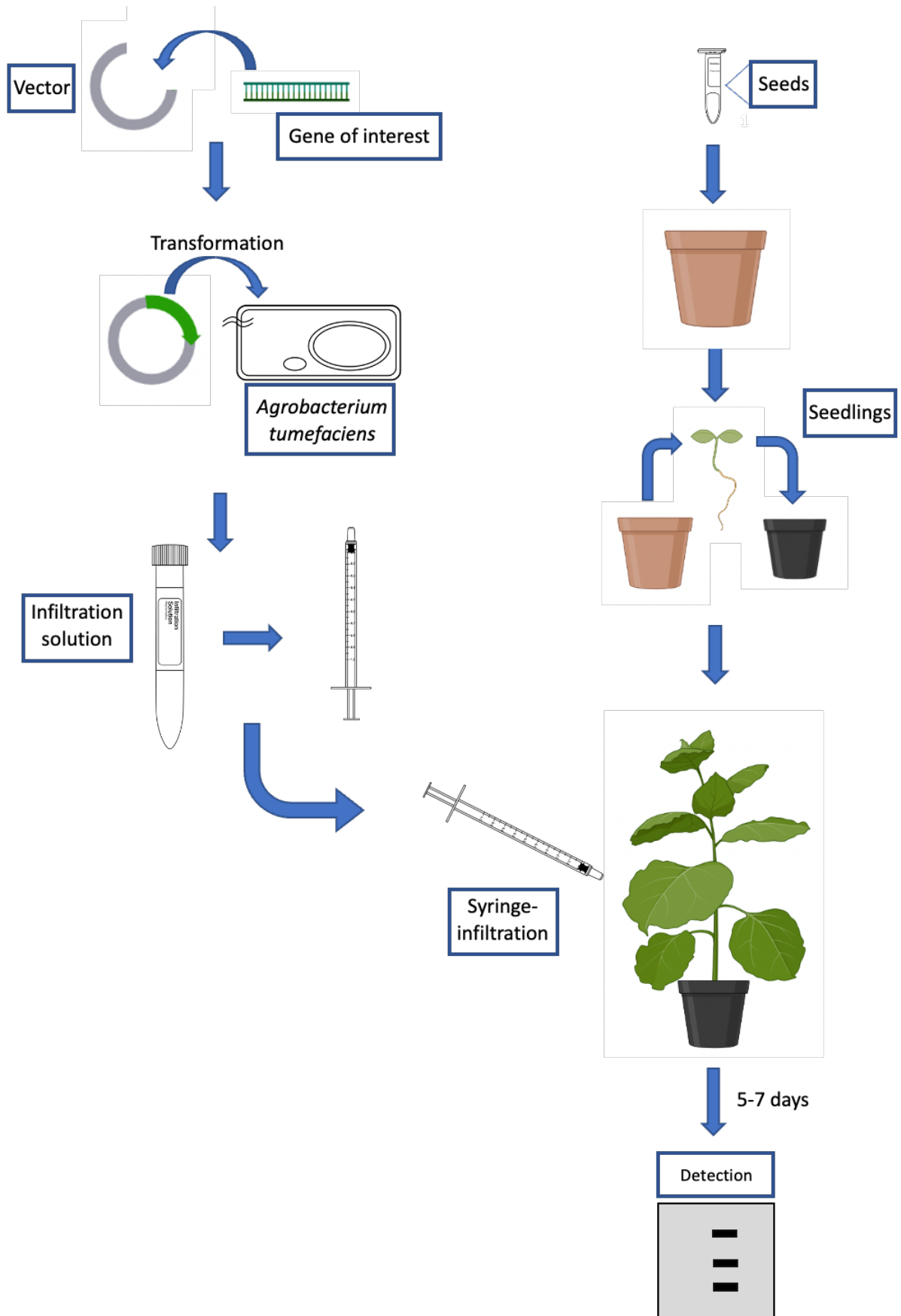
Firstly, you need to grow a few plants. This should be at room temperature in a well-lit area. From seed, plants will take 5-6 weeks to grow.

Whilst they are growing, you should prepare the expression vector containing your gene of interest, and transform the bacteria *Agrobacterium tumefaciens* with this vector.

Once the plants have grown they are ready to be ‘infiltrated’ with the transformed agrobacteria. Agrobacteria naturally have the machinery to introduce your vector into plant cells and initiate transient expression, resulting in the plant producing your protein to harvestable levels within 5-7 days after infiltration. The leaves can then be harvested, homogenised, and used directly in detection assays such as ELISA or western blot.

Have a go! If it doesn’t work, at least you’ll have an attractive plant for your lab.

Workflow:



Kit contents:

- Instructions and videos available online.
- *N. benthamiana* seeds, soil and plant pots.
- Plant expression vector and Control vector (with GFP as insert).
- *Agrobacterium tumefaciens*.
- Infiltration medium.
- Syringe for infiltration.

Not included:

- Antibiotics (Rifampicin, Kanamycin and Carbenicillin required)
- PCR primers
- Standard lab reagents e.g., PBS, LB broth, polymerase etc.

To order:

For an initial period, PMF Kits are being provided free of charge.

Please contact Julian Ma (jma@sgul.ac.uk) with your request. Include your name, delivery address, and please let us know why you are attracted to trying out the kit.

Delivery may not be possible to all parts of the world, but we will do our very best. In some countries, we may not be able to provide all components of the kit. If so, we will provide detailed advice on how to obtain everything you need. In some cases, we may need to charge delivery costs.