



## 4. Type I diabetes: how molecular and cell biology research facilitate treatments: Solutions

### What is type I diabetes?

Every year, about 90 000 people worldwide, mostly children and young people, are diagnosed with type 1 diabetes – a disease in which the body does not produce the hormone insulin. Type 1 diabetes patients develop an autoimmune response against insulin-producing beta-cells in the pancreas, i.e. their immune system attacks and destroys these cells, and the absence of insulin leads to elevated blood glucose levels. *You can learn more about insulin, its release, actions and regulation in*



Complete the table by writing the correct number from the diagram next to each label.

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<http://cnx.org/contents/e42bd376-624b-4c0f-972f-e0c57998e765@4.2>

Number	Label
6	Genetically modified bacterium
3	Human DNA
5	Plasmid, which has insulin gene inserted
1	Human cell
2	Plasmid*
7	The progeny of genetically modified bacteria
4	Insulin gene



## References

1. *Cell* 159, 428-439 (2014). *Vitro.*
2. Rezania, A. et al. Reversal of diabetes with insulin-producing cells derived in vitro from human pluripotent stem cells. *Nature Biotechnology* 32, 1121-1133 (2014).