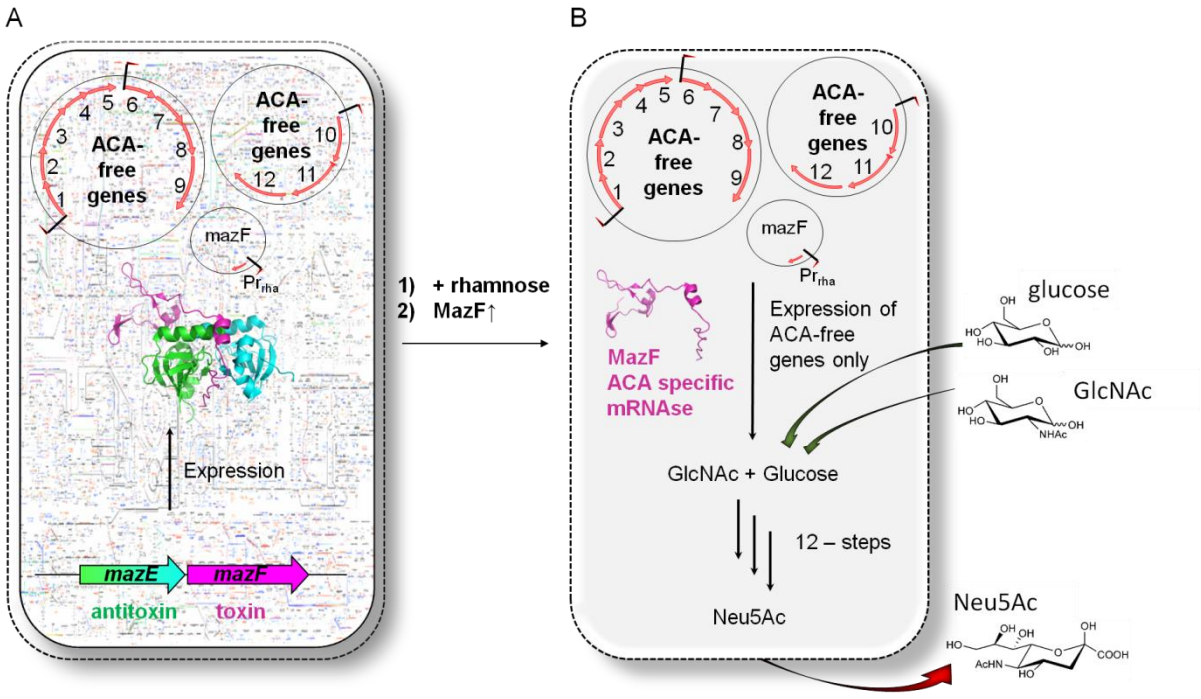

Figure 1. MazProTec strategy towards Neu5Ac production. Designed are engineered *E .coli* bacteria which contain three plasmids of which two encode the artificial Neu5Ac pathway, built up of 12 ACA-free genes, and one the endoribonuclease MazF under tight control of the rhamnose-inducible expression system. **A** Under native conditions the *E. coli* bacteria co-express endogenous MazF together with the antitoxin MazE and does not exhibit the MazF encoded toxic ACA-specific mRNAse activity. **B** After adding the inducer rhamnose and triggering overexpression of plasmid born MazF, the large protein complement of a growing bacterial cell does not get continuously biosynthesized, resulting in modification of the cellular transcriptome and a limitation of protein synthesis towards proteins from ACA-free genes as the assembled 12-part Neu5Ac pathway. By feeding GlcNAc and glucose, the MazF- induced system with enriched biocatalyst production produces Neu5Ac by following a 4.5 times higher productivity than cells from the none-induced state.