



Towards versatile, antibiotic-specific carbohydrate formulations for decreasing antibiotics-use and side-effects

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Introduction

Long-term antibiotics-use negatively impacts live-stock and humans, including negative influences on microbiota and gut-barrier function. Additionally, multidrug resistance remains a major threat. Reduction of antibiotic-use is therefore a major focus of society and is addressing human as well as animals as many antibiotic resistant-organisms have developed in livestock. Here, we propose to reduce antibiotics-use by application of specific formulations of dietary-fibers.

The central hypothesis of this proposal is that **specific combinations of resistant starches and GOS can prevent and support the recovery of gut microbiota and barrier-function in an antibiotics specific fashion** and the permanent addition of these components to food and feed can prevent frequency of infectious diseases.

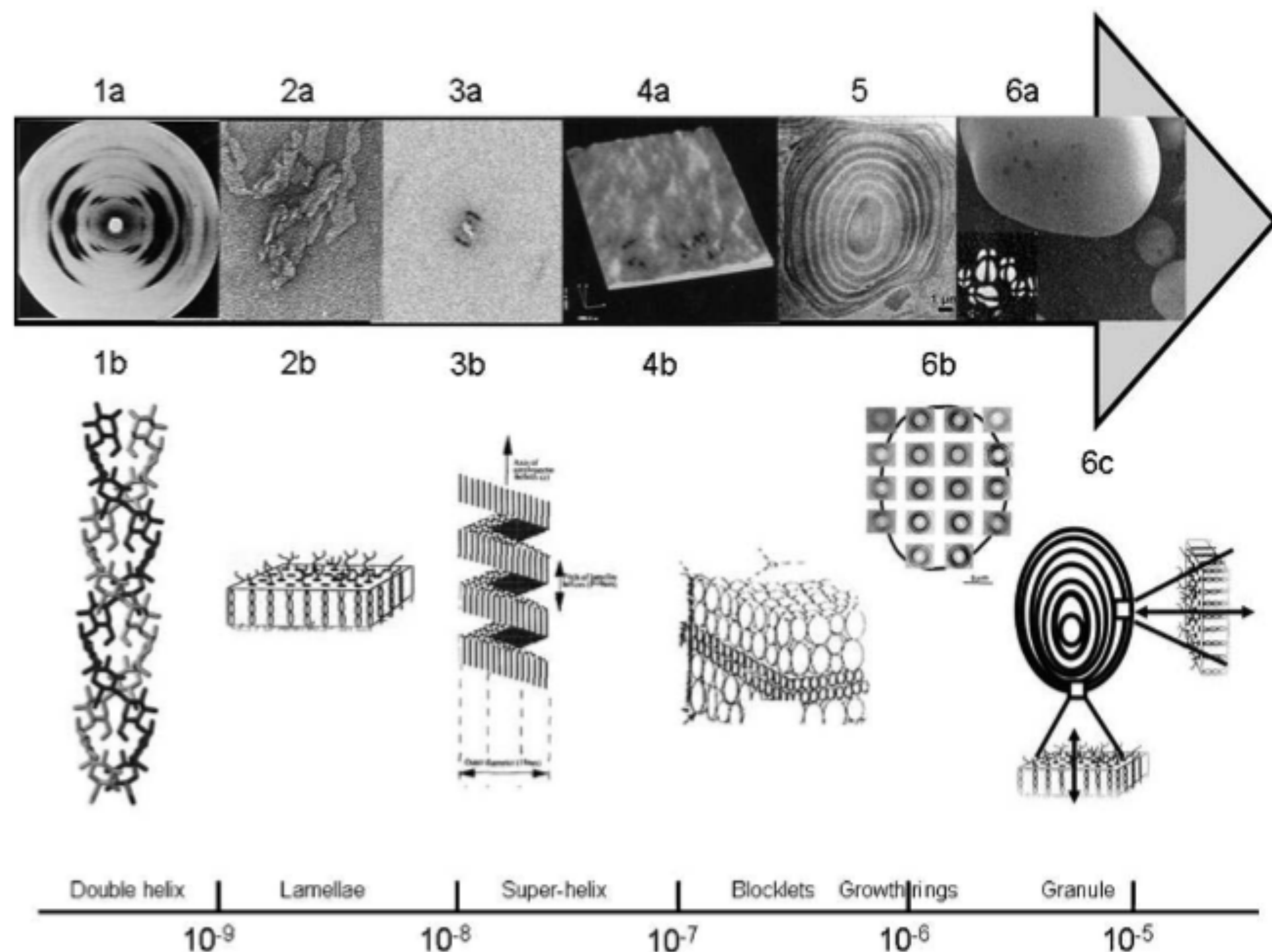


Figure 1: The molecular structures of starch components will be varied. Different starch architectures will be tested for beneficial in presence and absence of different GOS formulations on several gut parameters and on prevention or recovery of microbiota when exposed to specific microbiota .

Key questions to be addressed

What is the impact of specific RS and GOS formulations on microbiota composition and metabolic microbial activity before, after and during exposure to antibiotic?

Can RS and GOS formulations prevent or contribute to recovery of the mucosal barrier after exposure to a model pathogens and/or antibiotics?

Can RS and GOS formulations prevent pathogen adhesion and invasion in the presence and absence of antibiotics?

Pilot proof of principle study in humans.

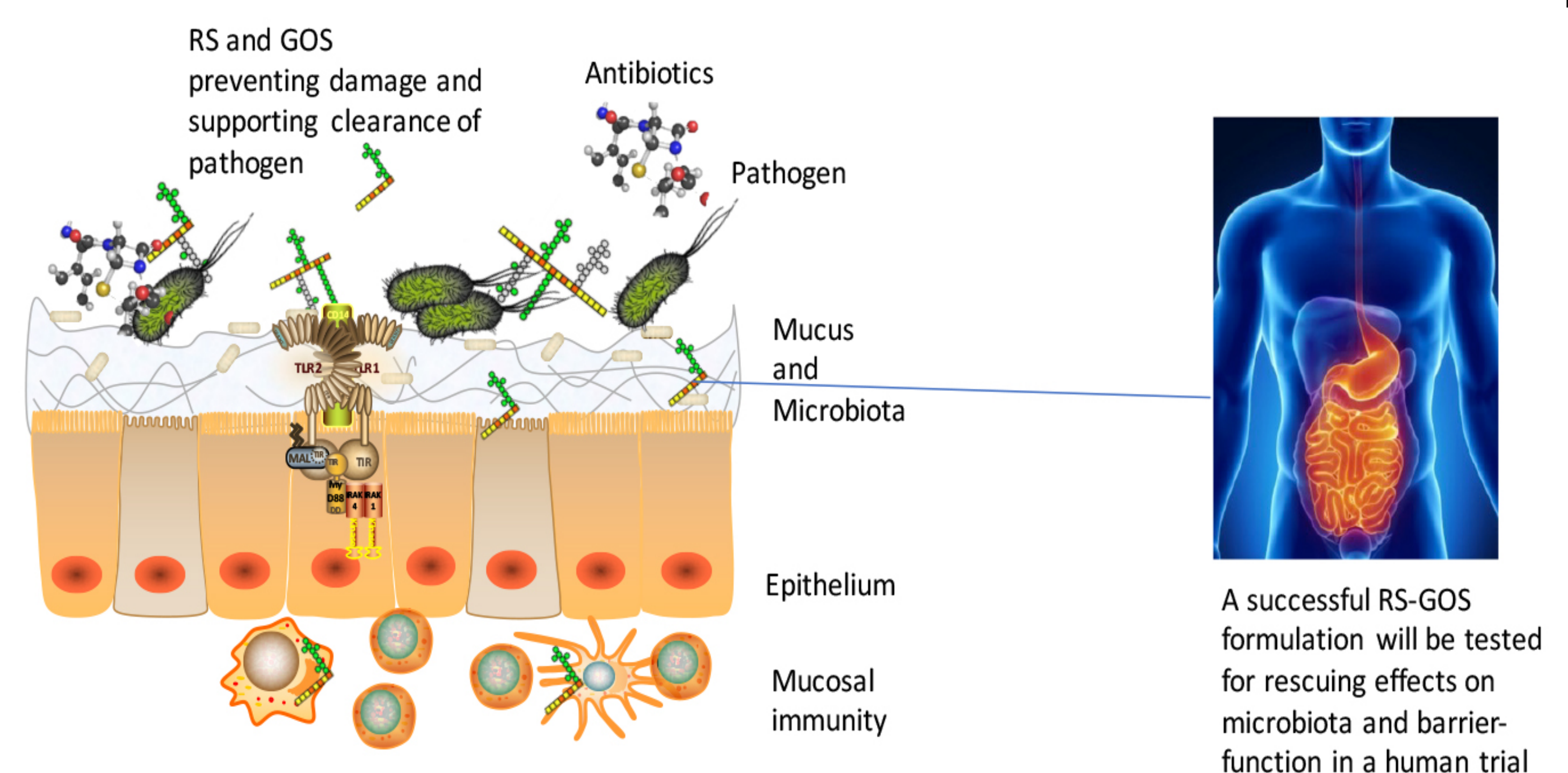


Figure 2: Project strategy. Large numbers of novel RS formulations and GOS will be screened in vitro for efficacy to prevent damage to microbiota, mucus production, epithelial integrity and pathogen clearance. Successful combinations will be tested in humans.

Anticipated deliverable:

Efficacious, industrial applicable RS/GOS-formulations to prevent antibiotics-induced mucosal damage for a selected number of commonly used antibiotics in live-stock and humans.