# Develop an antimicrobial packaging using isothiocyanates

**Target:** BLT, MFT

**Supervisors**

Jenneke Heising (jenneke.heising@wur.nl);  
Matthijs Dekker (matthijs.dekker@wur.nl)

**Topic description**

Antimicrobial packaging belong to the category of active packaging and currently many developments are taken place in this research field. Active packaging interacts with the product or the headspace in the food package. The aim of this interaction is to obtain desired conditions for a specific function or to optimize the quality of foods. Likewise, antimicrobial food packaging acts to reduce, inhibit or retard the growth of microorganisms that may be present in the packed food or packaging material itself.

Antimicrobial packaging can take several forms including:

1. Addition of sachets/pads containing volatile antimicrobial agents into packages.

2. Incorporation of volatile and non-volatile antimicrobial agents directly into polymers.

3. Coating or adsorbing antimicrobials onto polymer surfaces.

4. Immobilization of antimicrobials to polymers by ion or covalent linkages.

5. Use of polymers that are inherently antimicrobial.

In this research we will study the antimicrobial effects of isothiocyanates (ITCs) from glucosinolates. ITCs are breakdown products from glucosinolates, phytochemicals that are naturally present in brassica vegetables. In research it has been shown that glucosinolates and their breakdown products have antimicrobial effects. Therefore we would like to use these compounds to develop an antimicrobial package. We need to study the application of the ITCs on the package, so which form will give the best effects. Furthermore we need to study the release of the ICTs from to the headspace of the package and develop mathematical models for this.

For more information please contact Jenneke Heising [Jenneke.Heising@wur.nl](mailto:Jenneke.Heising@wur.nl)