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Functional foods, gut microflora and healthy ageing
Project Coordinator:  
INRA, France (Joël Doré)

Partners:  
DIfE, Germany (Prof. M. Blaut)  
Karolinska Institute, Sweden (Dr. L. Norin)  
Università di Camerino, Italy (Prof. A. Cresci)  
University of Reading, UK (Dr. W. Rastall)  
University of Ulster, Northern Ireland (Dr. I. Rowland)  
ORAFTI, Belgium (Dr. J. Van Loo)  
Danone, France (Dr. O. Goniak)
General objective:
Improve quality of life and promote health of the independent European elderly population via preventive nutrition strategies.

Specific objectives:
1- Assess the effect of ageing on the composition and activities of the intestinal microbiota.
2- Assess the ability to modulate the balance of the intestinal microbiota with functional foods to the benefits of the elderly population.

Scientific approach:
Clinical trials with human volunteers
Demographic evolution from 1995 to 2015

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>number (millions)</th>
<th>proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>-4,8</td>
<td>-7</td>
</tr>
<tr>
<td>15-29</td>
<td>-13</td>
<td>-16</td>
</tr>
<tr>
<td>30-49</td>
<td>0,6</td>
<td>0</td>
</tr>
<tr>
<td>50-64</td>
<td>+16,5</td>
<td>+26</td>
</tr>
<tr>
<td>over 65</td>
<td>+17</td>
<td>+30</td>
</tr>
<tr>
<td>over 80</td>
<td>+5,5</td>
<td>+39</td>
</tr>
</tbody>
</table>


- In 2025: 1/3 of the population will be over 60
- Senescence of gut physiology and immunology is associated with increased risk for infectious and degenerative diseases
- Improving health of the independent elderly population has major socio-economic implications
Towards the scientific, medical and health care communities:

• Ageing is accompanied by alterations in the gut microbiota (microbial and functional biomarkers of ageing).

Towards the food industry:

• A functional food combining a probiotic and a prebiotic can modulate the composition of the intestinal microbiota of seniors.
• Novel bacterial isolates were ranked as candidate probiotics.
• Synergistic associations between selected potential probiotics and prebiotics were identified.
Conclusions:
• The intestinal microbiota of seniors is more permissive to colonization.

Perspectives:
• There is a need to design strategies to improve
  ➢ Non specific immune defenses of seniors
  ➢ Specific resistance to colonization by pathogens
• Intestinal health must be considered within a multi-disciplinary approach towards healthy ageing.