

Titre du projet de recherche (Doit être identique au titre dans la demande de projet)	Peanut allergen sensitization in fiber-rich or fiber-free diets with or without CTX as an adjuvant.	
But du projet de recherche (Cochez la case correspondante, des sélections multiples sont possibles)	Recherche fondamentale Recherche translationnelle et appliquée Application pour des fins réglementaires et la production de routine Protection de l'environnement dans l'intérêt de la santé et du bien-être des hommes et des animaux Préservation des espèces Formation supérieure ou formation ayant le but d'obtenir, de préserver et de développer des capacités professionnelles Examens forensiques / Requêtes légales Conservation des colonies d'animaux génétiquement modifiés, qui ne sont pas utilisés dans d'autres projets de recherche	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Bénéfices prévus à travers ce projet de recherche (max. 1500 caractères) Quelles sont les avancées scientifiques qui pourront être tirées de ce projet (concernant l'homme et les animaux) ?	<p>Food allergy is on the rise in the western world. According to the CDC, the prevalence of reported food allergy among U.S. children under 18 has increased by 50% from 1997 to 2011. This equates to approximately 4% of the entire population (children and adults) living with food allergies. In Europe, the prevalence of food allergy is even higher, at approximately 10%. Our understanding of the role of the human microbiota in health and disease has been evolving as more evidence is presented. It has been shown in several non-communicable diseases (NCDs) that the host microbiota influences disease onset, including inflammatory bowel disease, asthma, and allergy. This supports the biodiversity hypothesis that introduces the idea that the changes adapted into Western lifestyle has reduced our exposure to microorganisms, furthermore affecting immune tolerance and sensitization. A significant aspect of Western lifestyle is our changed diet. It has been shown that through the past generations, our intake</p>	

	<p>of dietary fiber has significantly decreased to well below the recommended intake. We have recently shown that in a gnotobiotic mouse model (with a defined intestinal flora) put on a fiber-free (FF) diet, mucus-degrading bacterial communities out compete fiber-degrading species, leading to a thinning colonic mucus layer. In addition, the fiber-deprived community promotes aggressive colitis by <i>C. rodentium</i>, an enteric mouse pathogen (Desai et al. <i>Cell</i>, 2016, 167:1339-1353). In this study, we are interested in further exploring the mechanisms that facilitate the sensitization to food allergy.</p> <p>In our first allergy sensitization protocol, we successfully supported our hypothesis that the group of mice fed the fiber-free diet were more susceptible to sensitization. In this past experiment, we observed a stronger sensitization to ovalbumin (OVA; based on the results from the allergen challenge) in fiber free mice in both the group sensitized with OVA and CTX (cholera toxin) and without CTX (weekly gavage of OVA alone). We are in need of repeating this experiment in an additional allergy model using another common allergen source, peanut, by using peanut extract (PN).</p>									
<p>Dommages causés à travers ce projet de recherche (max. 500 caractères) Quels sont les éventuels effets néfastes attendus sur les animaux ? Qu'arrive-t-il aux animaux à la fin de l'expérience ? Nommez le niveau de sévérité selon la loi européenne (cf. « guidelines », voir sources)</p>	<p>We have previously shown that a fiber free diet is not harmful to mice. It will cause the mice to develop a thinner mucus layer compared to mice fed a normal diet. In addition, we have shown that the mice with a thinner mucus layer have a stronger reaction to allergen challenge at the end of the sensitization process. At the end of the protocol, the animals will be sacrificed via cervical dislocation. The level of severity will be 'moyen'.</p>									
<p>Espèce et nombre d'animaux utilisés Cochez la case correspondante et indiquez le nombre. Des sélections multiples sont possibles.</p>	<table border="1"> <tr> <td>Souris</td> <td><input checked="" type="checkbox"/></td> <td rowspan="4">60 souris BALB/c,</td> </tr> <tr> <td>Rats</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Poissons zébra</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Autres :</td> <td><input type="checkbox"/></td> </tr> </table>	Souris	<input checked="" type="checkbox"/>	60 souris BALB/c,	Rats	<input type="checkbox"/>	Poissons zébra	<input type="checkbox"/>	Autres :	<input type="checkbox"/>
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Autres :	<input type="checkbox"/>									
<p>Application du principe des 3 R de Russel et Burch (1959) (Laissez-vous guider par les questions)</p>										
<p>Remplacement / Remplacement (max. 500 caractères) Pourquoi le but de ce projet ne peut-il être atteint par d'autres méthodes ? Pourquoi l'expérimentation animale ne peut-elle être remplacée ?</p>	<p>This project aims to clarify the role of the intestinal flora, diet, and the colonic mucus layer in food allergen sensitization. In order to understand this interplay, it is necessary to investigate these effects in a complex organism. It is also crucial to use a controlled environment. In this respect, an alternative approach is not possible.</p>									

<p>Reduction / Réduction (max. 500 caractères) Expliquer comment le nombre d'animaux utilisé est réduit au minimum indispensable (biostatistiques) ?</p>	<p>This protocol involves using 3 experimental branches. Each branch will test two groups, fiber-rich and fiber-free diet. The first branch will test a classical model of allergen sensitization, which consists of repeated exposure to the allergen with an adjuvant, in this case we will use cholera toxin. Our second branch will test sensitization without adjuvant. Our third branch will be a control group in which the mice will receive a placebo of PBS. We will use 10 mice per group in order to guarantee statistically significant results. This number is based on the number of species from our own experiments that involved identical readouts, and which produced statistical significance.</p>
<p>Refinement / Amélioration (max. 500 caractères) Expliquer les mesures générales mises en œuvre pour minimiser les répercussions négatives sur le bien-être animal? Comment les dommages sont-ils réduits ? Pourquoi utilisez-vous cette espèce précise ?</p>	<p>The animals will be weighed and observed at regular intervals throughout the protocol. After the beginning of the sensitization, the mice will be checked daily. In addition, we have created a symptom score chart that will be used to determine if the mice should be removed from the study based on adverse reactions. BALB/c mice are used often to study allergy as they are ideal models.</p>