AniRA ImmOs

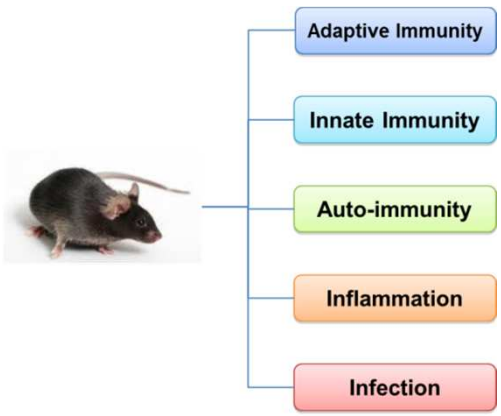
Une plateforme de phénotypage immunitaire au service de la communauté scientifique

AniRA ImmOs offre aux chercheurs en prestation de service, la possibilité d'analyser l'ensemble du système immunitaire et sa fonctionnalité à l'aide de méthodes standardisées et quantitatives validées dans le cadre du programme européen de phénotypage EUMODIC [1]

AniRA ImmOs a pour ambition de développer des technologies innovantes permettant d'étudier le système immunitaire et d'amplifier les recherches en immunologie et infectiologie. Les outils développés au sein de la plateforme **AniRA ImmOs** bénéficieront à l'ensemble de la communauté scientifique.

AniRA ImmOs propose :

- ✓ des tests multiparamétriques innovants
- ✓ des modèles physiopathologiques animaux
- ✓ une expertise, un transfert de technologies et un soutien technique

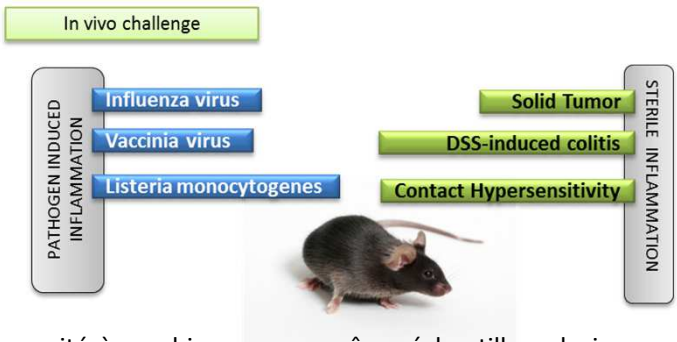


Notre activité s'appuie en grande partie sur le plateau de cytométrie en flux « **AniRA-Cytométrie en Flux »** qui possède actuellement un parc de 10 cytomètres analyseur et 2 trieurs

- Marquages multiparamétriques validés et standardisés
- Etude des sous populations leucocytaires à partir de
  - ✓ sang total
  - ✓ organes lymphoïdes primaires et secondaires
  - ✓ MALT (mucosal associated lymphoid tissus) etc…
- Evaluation de la fonctionnalité des lymphocytes cytotoxiques

AniRA ImmOs établit en permanence de nouveaux tests.

Anira ImmOs développe des modèles physiopathologiques animaux afin étudier les réponses immunitaires contre divers agents infectieux. Notre activité s'appuie principalement sur l'animalerie « **AniRA-PBES »** qui propose des niveaux de confinement A1, A2 et A3.



La particularité de la plateforme **AniRA ImmOs** est sa capacité à combiner sur un même échantillon plusieurs types de tests augmentant ainsi la puissance d'analyse biologique. Cette approche multiparamétrique est possible grâce à une étroite collaboration avec les autres plateaux AniRA de la **SFR Biosciences Gerland (UMS 3444)** ainsi qu'un soutien des équipes de recherche locales (CIRI) spécialisées en immunologie & infectiologie.

[1] A comparative phenotypic and genomic analysis of C57BL/6J and C57BL/6N mouse strains. **Genome Biol.** 2013 Jul 31;14(7):R82.

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Web site : www.ifr128.prd.fr/anira/phenotyping_immos.htm

AniRA ImmOs

Mouse phenotyping services :

Adaptive Immunity

Frequency of main leukocyte subsets
Identification and quantification of cells repartition in blood or tissus (spleen, lymph nodes, thymus, bone marrow, peritoneal lavage, MALT…)

- ✓ T CD4+ (naïve, effector, memory)
- ✓ T CD8+ (naïve, effector, memory)
- ✓ T Regs (CD25+ Foxp3+)
- ✓ TCR γδ and αβ lineage
- ✓ B cells (FO,MZ, B1a,B1b, B2, transitional T1,T2, plasmocytes)
- ✓ Monocytes, Granulocytes…

Activation threshold of T cells (in vitro stimulation)

- ✓ Production of IFNγ, TNFα after PMA/ionomycin stimulation.
- ✓ Production of IFNγ, TNFα after anti-CD3 & anti-CD28 stimulation
- ✓ CD8+T cells degranulation assessment by CD107 cell surface exposition

B cells homeostasis
Measurement of mouse immunoglobulin isotype levels in serum by ELISA.
The immunoglobulins that are measured are IgM, IgA, IgG1, IgG2a, IgG2b, IgG3

Innate Immunity

Phenotype of NK cell subsets :
Identification and quantification of NK cell in blood or tissues (spleen, lymph nodes)
✓Maturation stage of NK cells (CD27/CD11b phenotype)

Activation threshold of NK cells *In vitro stimulation*
Assays for cytokines production (IFNg) and degranulation (CD107 cell surface exposition) after:
✓IL12 stimulation
✓IL12+IL18 stimulation
✓IL12+hIL2 stimulation

Phenotype of monocytes, macrophages
Identification and quantification of blood monocytes or macrophages in second lymphoid organs (spleen, lymph nodes)

Auto-Immunity

The occurrence of auto-antibodies in sera is measured by determining the presence and the levels of anti-nuclear antibodies (ANA).

Inflammation

Inflammatory Bowel Disease (IBD): DSS-induced colitis
Dextran sulfate sodium (DSS) is the most widely used mouse model of Ulcerative Colitis. DSS is directly toxic to gut epithelial cells of the basal crypts and affects the integrity of the mucosal barrier. Mice are treated with DSS and are daily monitored for body weight loss, stool consistency and rectal bleeding, which are indicative signs of colitis, for a period of 2 weeks. Colon can be further evaluated histologically for inflammation which indicates colitis severity.

Contact Dermatitis: Delay-Type Hypersensitivity response (type IV)
Contact hypersensitivity is an experimental model of human allergic contact dermatitis. This inflammatory skin condition is induced by exposure to environmental agents. Substances responsible for contact dermatitis, after single or multiple exposures, are non-protein chemicals (i.e. haptens) that induce skin inflammation through activation of innate and adaptive immunity. The DTH response is assessed by the measurement of ear induced edema (DNFB model)

Infection

Capacity to develop an antibody response:
Humoral response *(Influenza* virus infection)
Mice are infected with *Influenza H1N1* virus. Disease progression in mice is monitored through the weight loss of mice for a period of 10 days after infection. The capacity to develop an antibody response is measured by an Influenza hemagglutination inhibition assay

Capacity to develop a CD8+ T cell response :
Cellular response (*Vaccinia* virus infection)
Mice are infected with Vaccinia virus. The immune reaction of infected mice is monitored through the follow up of virus-specific CD8+ T cells in blood or spleen.

Capacity to survive to an infection
Listeria monocytogenes infection
Mice are infected with the pathogenic intracellular bacterium *Listeria m.* at semi-lethal doses. The immune reaction of infected mice is monitored by daily weight loss for a period of 10 days after infection