POSITION

1. Project Title/ Job Position title:

Unveiling improper immune response interactions with respiratory microbiota and viroma in the developing of recurrent wheezing after bronchiolitis.

2. Area of Knowledge:

Life Sciences

3. Group of disciplines:

Medicine, Public Health, Sport Sciences, Nutrition, Clinical Psychology, Health Management

4. Research project/ Research Group description

Bronchiolitis is the most common lower respiratory tract infection in infants and is the leading cause of hospitalization of children younger than 1 year of age. Respiratory syncytial virus (RSV) is the most frequent virus responsible for bronchiolitis worldwide, followed by rhinovirus (HRV), and others as human bocavirus (HBoV) and human metapneumovirus (hMPV).

Approximately 30% to 70% of infants develop bronchiolitis after primary RSV infection and 1% to 3% of them are hospitalized. Infants, who are affected with RSV or HRV bronchiolitis during their first months of life, frequently develop recurrent wheezing and asthma. Several mechanisms have been proposed to explain the different short and long term severity of bronchiolitis. One of the most widely accepted theories attributes severe RSV-bronchiolitis to an imbalance in the Th1/Th2 immune response.

Several observations link the risk of asthma with inappropriate microbial colonization of the respiratory tract. The presence of potentially pathogenic bacteria (*Moraxella catarrhalis, Haemophilus influenzae*, or *Streptococcus pneumoniae*) in the oropharynx of young children was significantly associated with an increased risk of developing asthma in childhood. It is likely that the interactions between viruses and bacteria present within the ecological respiratory niche can modulate the patient's immune response, affecting the course of the respiratory infection and its consequences in the future.

The “Pediatric Respiratory, Systemic and Neurologic Infections & Host Innume Response” group is conducting an ongoing project with the aim to know the response to the viral infection that is triggered in hospitalized children with bronchiolitis through the detection in the nasopharyngeal aspirate of microbiota and interleukins (ILs), as well as to correlate them with the severity of the acute episode and with the development of recurrent wheezing and asthma in the long term.

5. Job position description

Role: The applicant will be trained to perform and coordinate the different activities of the project within the group and its collaborators:

- National Center of Microbiology:
  - Viral screening (multiple RT-PCR in real time).
  - Viral detection and identification (NGS).
- Jiménez-Díaz Foundation:
  - Flow cytometry.
  - Biomarkers of inflammation, innate and adaptive immune response (LuminexR Multiplex).

- Analysis of innate response (TL3, IL33, IL1RL1), inflammation (IFNG, IL10, IL13) and epithelial damage (POSTN, TSLP, FLG, AREG), by semiquantitative Real Time PCR.

- Institute of Agrochemistry & Food Technology (Valencia):
  - Study of the microbiota (NGS).

The clinical samples of the patients will be collected in the Severo Ochoa (Leganés) and La Paz Hospitals.

Responsibilities

Set up and perform experiments, maintain experimental resources (as cell lines, reagents, etc.) according to protocols, analyze & interpret results and contribute to the development of experimental strategies with accuracy and honesty.

Keep updated the laboratory notebook and properly store and manage the data produced during the project.

Collaborate with colleagues and participate in team activities (such as meetings, seminars, workshops, etc.) across the research group and wider scientific community while keeping up to date with current knowledge and recent advances.

Participate in knowledge exchange with several stakeholders, to promote the value of research in public health and to contribute to the dissemination of his/her research results in the principles of EU's Open Science policy.

Undertake any other duties of equivalent standing as assigned to him/her.

Skills

Degree in Life Sciences.

Motivation, critical thinking and problem-solving oriented skills.

Good interpersonal skills, including team working.

Good communication skills, willingness to engage in public presentations.

Good time and workload management skills, including both initiative and flexibility.

GROUP LEADER

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4. **Research project/ Research Group website (Url):** http://www.idipaz.es/PaginaDinamica.aspx?IdPag=53&Lang=EN

OTHER RELEVANT WEBSITES

www.ritip.org Translational Research Network in Pediatric Infectious Diseases (coordinated by the Group Leader).