TITLE

The impact of epigenetics in the current epidemics of type 2 diabetes

DESCRIPTION

Type 2 diabetes (T2D) and obesity are major public health problems. Substantial efforts have been made to define loci and variants contributing to the individual risk of these disorders. However, the overall risk explained by genetic variation is very modest. Epigenetics is one of the fastest growing research areas in biomedicine as changes in the epigenome are involved in many biological processes, impact on the risk for several complex diseases including diabetes and may explain susceptibility (1-3). We have been investigating the hypothesis that lifestyle-determined epigenetic modifications primarily impact on the adipose tissue limiting its expandability in response to certain environmental hits as calore excess, and cause impaired recruitment and/or commitment of new pre-adipocytes, inappropriate fat cell expansion (hypertrophy), and dysregulation with local inflammation. The cumulative impact of these mechanisms may also lead to T2D. We aim at establishing whether and how a detrimental environment contributes to increased risk and/or accelerated development of T2D through common molecular pathways, possibly involving adaptive epigenetic modifications. We plan to investigate epigenetic variants in well-phenotyped populations aiming at verifying the hypothesis that epigenomic dysregulation predicts disease onset and contributes to the development of adipose tissue dysfunction through impaired recruitment and/or commitment of new pre-adipocytes. Moreover, the applicant will be involved in performing mechanistic studies aiming at defining the impact of specific epigenotypes of interest on diseased phenotype, using molecular biology approaches in cultured adipocytes.

A better understanding of how environmental cues give rise to the pathological sequelae which lead to T2D by identifying and interpreting the epigenomic changes occurring in at risk individuals is expected to enable the identification of predictive biomarkers and innovative targets as well as the stratification of patients according to risk of disease and susceptibility to specific treatment options.

References

1. Mirra P, Raciti GA, Nigro C, Fiory F, D'Esposito V, Formisano P, Beguinot F, Miele C. Circulating miRNAs as intercellular messengers, potential biomarkers and therapeutic targets for Type 2 diabetes. Epigenomics. 2015;7(4):653-67. doi: 10.2217/epi.15.18.
2. Raciti GA, Longo M, Parrillo L, Ciccarelli M, Mirra P, Ungaro P, Formisano P, Miele C, Béguinot F. Understanding type 2 diabetes: from genetics to epigenetics. Acta Diabetol. 2015 Oct;52(5):821-7.
3. Raciti GA, Nigro C, Longo M, Parrillo L, Miele C, Formisano P, Béguinot F. Personalized medicine and type 2 diabetes: lesson from epigenetics. Epigenomics. 2014 Apr;6(2):229-38.

SELECTION CRITERIA

Eligibility Criteria

- Academic degree: Applicants shall have a master degree in Biology and related fields such as Molecular Biology, Immunology, Cell Biology etc , corresponding to the second level of studies.
- Mobility rule: There will be no nationality restrictions. Applicants can be from any Country. However, according to the mobility rule, at the time of the application deadline researchers should not have resided or carried out their main activity (work, studies, etc.) in Italy for more than 12 months in the 3 years immediately

prior to the reference date. Compulsory national service and/or short stays such as holidays will not be taken into account.
- Research experience: Applicants shall, at the time of the application deadline, be in the first four years (full-time equivalent research experience) of their research careers and not yet awarded a doctoral degree.

Full-Time Equivalent (FTE) Research Experience will be determined from the date when a researcher obtained the degree which would formally entitle her/him to embark on a doctorate, either in the country in which the degree was obtained or in Italy, irrespective of whether or not a doctorate is or was ever envisaged.

Evaluation Criteria

Step 1 -Evaluation of documentation provided by the candidate: a) Academic record and training b) Research activities c) CV/motivation letter; d) Level of English; e) Reference letters.
Step 2 - Interview: a) Scientific knowledge in the field of interest; b) Research experience in the field of interest c), Motivation; d) English proficiency.

Supervisor

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http://www.ieos.cnr.it/personale/index.php?id=1429266231