

The Interinstitutional Multidisciplinary Biobank (BioBIM) : a valuable resource for the study of the interactions between migraine and food

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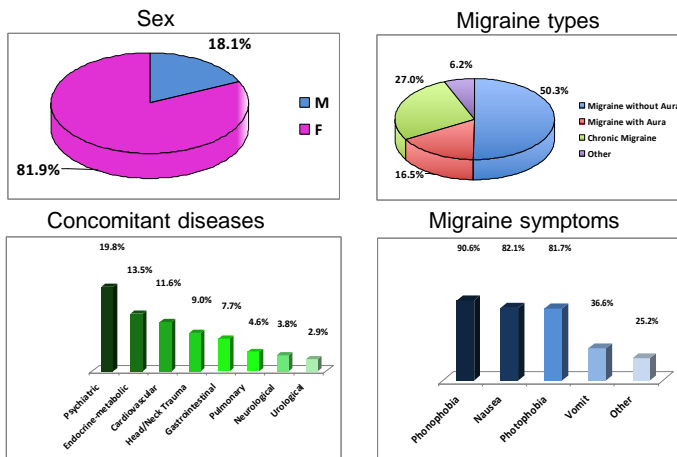
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Migraine is a common disabling pathology. It is a multifactorial and polygenic primary neurological disorder characterized by a condition of cerebral cortical hyperexcitability associated to several stimulations (hormonal changes, weather, food). Studies have shown a strong correlation between nutrition and migraine. Several commonly used drinks and foods, such as red wine or chocolate, may be involved in the mechanisms triggering the headache attack.

The development of Biobanks and recent advances in molecular biology have enhanced the identification of genetic factors involved in diseases onset, the investigation of interaction between genes and environmental factors and the development of an appropriate nutritional plan to avoid adverse interaction between disease and food. The Interinstitutional Multidisciplinary BioBank (BioBIM, IRCCS San Raffaele Pisana, Rome, Italy) is a large structured collection of biological samples, organized in different sections of pathology-based specimens, including a biobank dedicated to migraine.

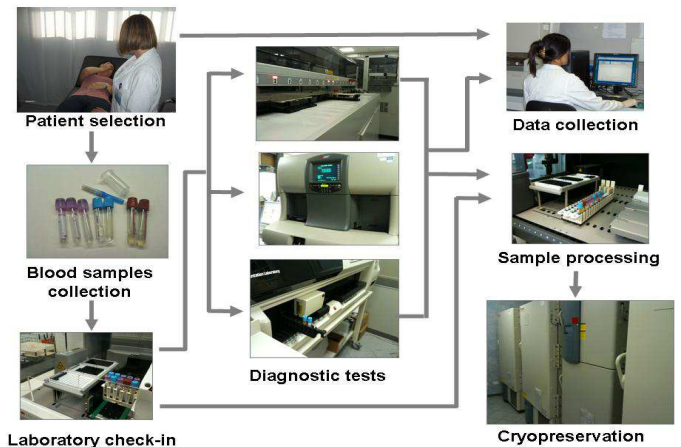


Sociodemographic profile and clinical characteristics of migraine patients included in the BioBIM (n = 800)

Starting from January 2008, more than 800 migraine patients referring to the Headache and Pain Unit of the Department of Neurological, Motor and Sensory Sciences (IRCCS San Raffaele Pisana) have been systematically cryo-preserved in the BioBIM. In this context, the availability of a migraine-dedicated biobank has already allowed the realization of several case-control genetic association studies.

Migraine BioBIM Bibliography

- Look beyond Catechol-O-Methyltransferase genotype for catecholamines derangement in migraine: the BioBIM rs4818 and rs4680 polymorphisms study. De Marchis ML, Barbanti P, Palmirotta R, Egeo G, Aurilia C, Fofi L, Piroso S, Ialongo C, Della-Morte D, D'Andrea G, Ferroni P, Guadagni F. *J Headache Pain*. 2015 Dec;16(1):520.
- Progesterone receptor gene (PROGINS) polymorphism correlates with late onset of migraine. Palmirotta R, Barbanti P, Ialongo C, De Marchis ML, Alessandrini J, Egeo G, Aurilia C, Fofi L, Valente MG, Ferroni P, Della-Morte D, Guadagni F. *DNA Cell Biol*. 2015 Mar;34(3):208-12.
- Is SOD2 Ala16Val polymorphism associated with migraine with aura phenotype? Palmirotta R, Barbanti P, De Marchis ML, Egeo G, Aurilia C, Fofi L, Ialongo C, Valente MG, Ferroni P, Della-Morte D, Guadagni F. *Antioxid Redox Signal*. 2015 Jan 20;22(3):275-9.
- Association between migraine and ACE gene (insertion/deletion) polymorphism: the BioBIM study. Palmirotta R, Barbanti P, Ludovici G, De Marchis ML, Ialongo C, Egeo G, Aurilia C, Fofi L, Abete P, Spila A, Ferroni P, Della-Morte D, Guadagni F. *Pharmacogenomics*. 2014 Feb;15(2):147-55.
- Prion protein gene M129V polymorphism and variability in age at migraine onset. Palmirotta R, Ludovici G, Egeo G, Ialongo C, Aurilia C, Fofi L, De Marchis ML, Della-Morte D, Barbanti P, Guadagni F. *Headache*. 2013 Mar;53(3):540-5.
- Establishment of a biorepository for migraine research: the experience of Interinstitutional Multidisciplinary BioBank (BioBIM). Palmirotta R, Barbanti P, Ludovici G, Egeo G, Aurilia C, Fofi L, De Marchis ML, Spila A, Ferroni P, Della-Morte D, Guadagni F. *Neurol Sci*. 2013 Sep;34(9):1659-63.



Workflow of sample acquisition: from patient selection to cryopreservation within the general organization of the BioBIM

These biological samples, associated to detailed clinical, socio-demographic and lifestyle data, have opened new interdisciplinary research lines addressing the interactions between genetics of migraine and food. Therefore our current efforts are aimed to the analysis of polymorphisms of genes coding for the enzymes involved in the metabolism of catecholamines and elusive amines, with the purpose of identifying the genetic basis of the individual sensitivity to migraine trigger-foods. In conclusion, the migraine biobank provides an indispensable resource to define a, customized and tailored diet for the numerous subjects affected by migraine.

