AL MAGNIFICO RETTORE
DELL'UNIVERSITA' DEGLI STUDI DI MILANO **COD. ID** 5645

[Atiyehsadat Sharifzadeh]

CURRICULUM VITAE

INFORMAZIONI PERSONALI

Cognome	Sharifzadeh
Nome	Atiyehsadat
Data Di Nascita	[23, 07, 1979]

OCCUPAZIONE ATTUALE

Incarico	Struttura
ASSEGNISTA DI RICERCA TIPO B	UNIVERSITA' DEGLI STUDI DI MILANO

ISTRUZIONE E FORMAZIONE

Titolo	Corso di studi	Università	anno conseguimento titolo
Laurea Magistrale o equivalente	Molecular Biology of the Cell	UNIVERSITA' DEGLI STUDI DI MILANO	2018
Specializzazione			
Dottorato Di Ricerca			
Master			
Diploma Di Specializzazione Medica			
Diploma Di Specializzazione Europea			
Altro			

ISCRIZIONE AD ORDINI PROFESSIONALI

Data iscrizione	Ordine	Città

LINGUE STRANIERE CONOSCIUTE

lingue	livello di conoscenza
Inglese	C1

PREMI, RICONOSCIMENTI E BORSE DI STUDIO

anno	Descrizione premio
2016-2018	Excellence Scholarships for best international students admitted to the Master's degree in Molecular Biology of the Cell, University of Milan, Milano, Italy

ATTIVITÀ DI FORMAZIONE O DI RICERCA

I've involved in the project of screening the binding of interactors to Hyperpolarization-activated cyclic nucleotide-gated (HCN) isoforms 1, 2 and 4, abundant respectively in the central nervous system, in the peripheral (nociceptive neurons) and in the heart. To achieve this goal, I use a fluorescence size exclusion chromatography-based thermostability assay (FSEC-TS) to monitor the binding of ligands to purify GFP-tagged HCN channels. We found that the melting temperature (Tm) of HCN increases due to binding of ligands. I used this method for the screening the binding of several interactors to HCN isoforms. Furthermore, we are identifying the ligand binding sites using the cryo-EM to reveal mechanisms through which the interactor can target the protein and propose future directions for research on therapeutics.

In addition, I also work on a project to select nanobodies that specifically bind HCN channels. The nanobodies correspond to the antigen-binding domain of the antibodies of the camelid family. This domain consists of a single small polypeptide chain (about 15kDa). These characteristics make nanodobies easily adaptable to biotechnological / pharmaceutical uses. In particular, this work aims to identify nanobodies capable of inhibiting the electrical activity of their target HCN channels, therefore can be used as blockers. These specific nanobodies for the three isoforms of HCN channels can be used for future applications in both biotechnology and pharmaceuticals. To isolate nanobodies selectivity bind the HCN isoforms, I use molecular biology and biochemical techniques, with special emphasis on the methods of transient expression in mammalian cells of membrane proteins and their subsequent purification. Equally relevant to the achievement of the objective of this work, I use the synthetic library of nanobodies expressed in yeast and the iterative processes of enrichment / selection of the nanobodies binding the desired antigens which can be carried out using two selection methods: MACS (Magnetic Activated Cell Sorting) and FACS (Fluorescence Activated Cell Sorting). The selected nanobodies are expressed heterologously in bacterial cells (E. coli) and purified in order to test their ability to bind and inhibit the electrical activity of the target HCN channel in electrophysiology experiments. The method has been already used for isolation of nanobodies interacting specifically to HCN4 pacemaker channels.

Recently, I have been trying another technique for nanobody selection based on the Cell-Cell interaction method. In this strategy I isolate nanobodies specific for whole cell membrane-associated antigens based on the interaction between yeast cells displaying nanobodies and mammalian cells expressing eucaryotic membrane proteins. This approach bypasses the step of membrane protein purification which is still a bottleneck of "difficult-to-purify membrane proteins", and enables the direct selection of nanobodies against membrane proteins in native state. I will use this approach for isolation of nanobodies interacting to other isoforms of HCN (HCN1 and HCN2) whose purifications are limited by the very low yields.

ATTIVITÀ PROGETTUALE

Anno	Progetto
2019-2021	Detection of ligand binding to purified HCN channels using the fluorescence size exclusion chromatography-based thermostability (FSEC-TS)
2021-2022	Screening nanobodies bind HCN4 pacemaker channels as targets for drug discovery using

	yeast display nanobodies
2022- now (ongoing)	Screening nanobodies bind HCN channels using Cell-Cell interaction technique

TITOLARITÀ DI BREVETTI

Brevetto

CONGRESSI, CONVEGNI E SEMINARI

Data	Titolo	Sede
11-14/09/2022	25th National Congress, Italian Society of Pure and Applied Biophysics (SIBPA). Poster presentations: (1) Isolation of state-dependent nanobodies against HCN4 channels using a yeast surface display platform; (2) Detection of cyclic di-GMP binding to purified HCN4 pacemaker channel	San Miniato (Pisa), Italy
8/02/2022	3rd Chembion Online Symposium, Westfälische. Poster presentation: Detection of cyclic di-GMP binding to purified HCN4 pacemaker channel	Wilhelms-Universität Münster, Germany (Online)
22-26/02/2021	65th Annual Meeting of the Biophysical Society. Abstract: Monitoring ligand binding to purified HCN4 channel proteins	Rockville, MD, USA (Online)
10/01/2020	noMAGIC Winter Retreat 2020; A Biochemical assay to detect ligand binding in purified full length HCN4 channels.	Technische Universität Darmstadt, Germany
10-12/09/2018	noMAGIC International Symposium: Ion channel design using experimental and computational inputs (participation).	Gargnano (BS) Italy

PUBBLICAZIONI

Libri
Saponaro A., Sharifzadeh A.S., Moroni A. "Detection of ligand binding to purified HCN channels using fluorescence-based size exclusion chromatography". Methods Enzymol. 2021; 652:105-123. doi: 10.1016/bs.mie.2021.01.043.
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Articoli su riviste
Saponaro A., Bauer D., Giese M.H., Swuec P., Porro A., Gasparri F., Sharifzadeh A.S., Chaves-Sanjuan A., Alberio A., Parisi G., Cerutti G., Clarke O.B., Hamacher K., Colecraft H.M., Mancia F., Hendrickson W.A., Siegelbaum S.A., DiFrancesco D., Bolognesi M., Thiel G., Santoro B., Moroni A. "Gating movements and ion permeation in HCN4 pacemaker channels". Mol Cell. 2021 81(14):2929-2943.e6. doi: 10.1016/j.molcel.2021.05.033.

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ALTRE INFORMAZIONI

Le dichiarazioni rese nel presente curriculum sono da ritenersi rilasciate ai sensi degli artt. 46 e 47 del DPR n. 445/2000.

Il presente curriculum, non contiene dati sensibili e dati giudiziari di cui all'art. 4, comma 1, lettere d) ed e) del D.Lgs. 30.6.2003 n. 196.

Luogo e data: Milano, 06/02/2023 Atiyehsadat Sharifzadeh A. sharifz

FIRMA

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