

AVAILABLE POSITIONS

Principal Investigator	Alessandro Vannini
Affiliation	Human Technopole, Milan
Title of the proposed project	Integrative structural biology of RNA Polymerase III complexes
Short description of the project	The eukaryotic nuclear genome is transcribed by the multi-subunit enzymes RNA Polymerase (Pol) I, II and III, which catalyze DNA-dependent RNA synthesis. Pol III transcribes genes encoding short non-coding essential RNAs, such as the entire pool of transfer RNAs (tRNAs). Additionally, Pol III plays a paramount role in numerous essential processes occurring in the nucleus and in the cytoplasm. The project will focus on integrative structural biology approaches (cryo-EM, cross-linking mass spectrometry and single-molecule biophysics) to unravel mechanistic insights into transcriptional and extra transcriptional roles of Pol III and their role into chromatin organization.
Main research area for the project	Structural Biology
Second research area for the project	
3 key words for project	Cryo-EM, chromatin, transcription
Main topic/s of the lab	Structural Biology of transcription and chromatin organization
Short description of the lab activity	The Vannini lab employs cutting edge structural biology techniques (cryo-EM, XL-mass spectrometry, single molecules biophysics) in order to unravel mechanistic details of RNA Pol III complexes in the context of gene transcription and chromatin organization, throughout their association with SMC complexes.
Recent bibliography	Condensin II activation by M18BP1 Alessandro Borsellini, Duccio Conti, Erin Cutts, Rebecca J. Harris, Kai Walstein, Andrea Graziadei, Valentina Cecatiello, Tom F. Aarts, Ren Xie, Abdelghani Mazouzi, Sushweta Sen, Claire Hoencamp, Richard Pleuger, Sabrina Ghatti, Lina Oberste-Lehn, Dongqing Pan, Tanja Bange, Judith H.I. Haarhuis, Anastassis Perrakis, Thijn R. Brummelkamp, Benjamin D. Rowland, Andrea Musacchio, Alessandro Vannini bioRxiv 2024.05.02.592151; doi: https://doi.org/10.1101/2024.05.02.592151 Molecular Cell (IN PRESS) Structural insights into distinct mechanisms of RNA polymerase II and III recruitment to snRNA promoters. Shah SZ, Perry TN, Graziadei A, Cecatiello V, Kaliyappan T, Misiaszek AD, Müller CW, Ramsay EP, Vannini A. Nat Commun. 2025 Jan 2;16(1):141. doi: 10.1038/s41467-024-55553-8. PMID: 39747245 Structural basis of SNAPc-dependent snRNA transcription initiation by RNA polymerase II.

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	Rengachari S, Schilbach S, Kaliyappan T, Gouge J, Zumer K, Schwarz J, Urlaub H, Dienemann C, Vannini A, Cramer P. Nat Struct Mol Biol. 2022 Dec;29(12):1159-1169. doi: 10.1038/s41594-022-00857-w.Epub 2022 Nov 24. PMID: 36424526 Structural basis of Ty3 retrotransposon integration at RNA Polymerase III-transcribed genes. Abascal-Palacios G, Jochem L, Pla-Prats C, Beuron F, Vannini A. Nat Commun. 2021 Nov 30;12(1):6992. doi: 10.1038/s41467-021-27338-w. PMID: 34848735 Structural basis of RNA polymerase III transcription initiation. Abascal-Palacios G, Ramsay EP, Beuron F, Morris E, Vannini A. Nature. 2018 Jan 17;553(7688):301-306. doi: 10.1038/nature25441.PMID: 29345637
Group composition	10 members: 3 PhD Students, 2 Senior Technicians, 1 Staff Scientist, 5 PostDocs
Institutional page link	https://humantechnopole.it/en/
Lab website link	https://humantechnopole.it/en/research-groups/vannini-group/