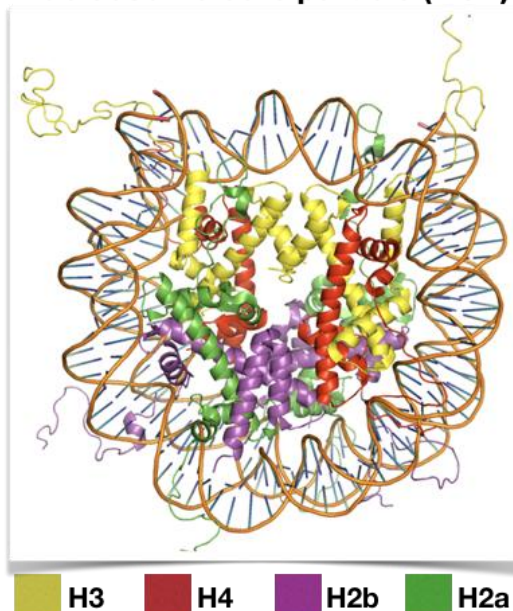


Faculty Profile	Dr. Padavattan Sivaraman Ph.D
Designation	Assistant Professor
Associated with NIMHANS as faculty since (Month and Year)	Oct 2017
Awards, Fellowships and Recognitions, Memberships	<ul style="list-style-type: none"> • 2017 - Research Fellow, Nanyang Technological University, Singapore • 2013 - Research Scientist, RIKEN SPring-8 Center, Japan (2012 - Received RIKEN SPring-8 award for scientific excellence) • 2006 - PhD Biophysics, Biozentrum, University of Basel, Switzerland • Member of Indian Crystallography Association (ICA)
Areas of Research Interest	Chromatin Structural Biology
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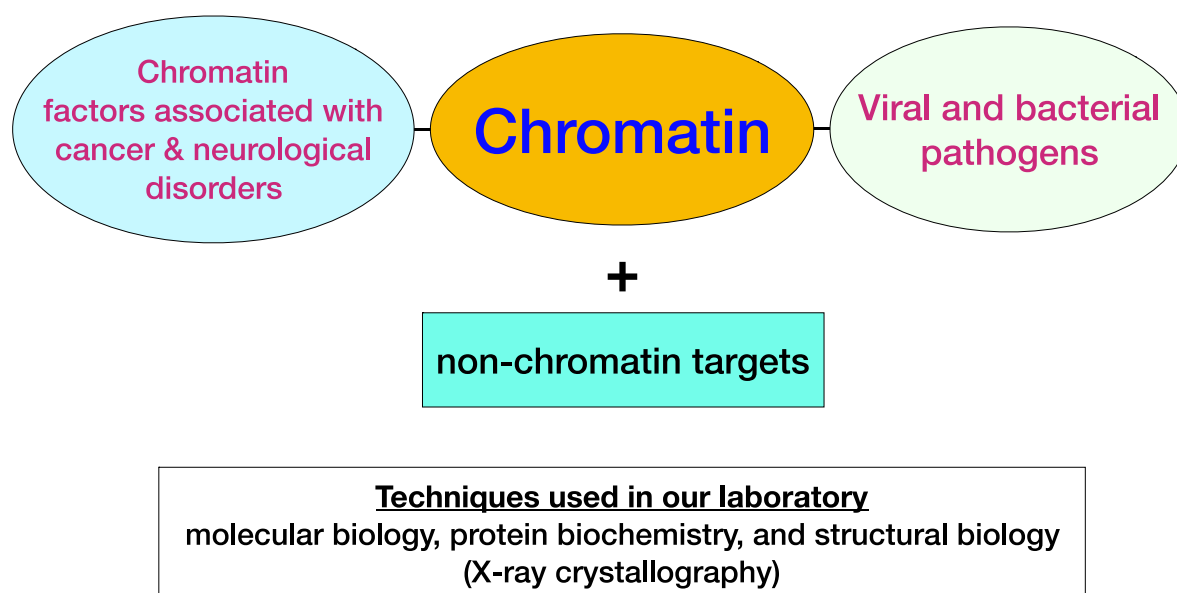
Research interests

Genomic DNA in the eukaryotic cell is packaged into a condensed structure called chromatin. The nucleosome is the basic repeating unit of eukaryotic chromatin and comprises a core region and linker DNA. The core region is usually referred to as the **nucleosome core particle (NCP)**, which comprises of ~146bp dsDNA wrapped around two copies each of four different core histone proteins [(H2a-H2b-H3-H4) x 2]. Chromatin is a dynamic structure and is regulated by various factors like epigenetic modification, histone variants, chromatin remodelers etc. Each of these factors can influence chromatin structure thereby tightly controlling gene expression, DNA replication, and repair. Loss or alteration of their functions can have detrimental consequences leading to various human diseases like cancer and neurological disorders. Furthermore, several human pathogens (viruses and bacteria) manipulate the host chromatin in order to take over their cellular functions, which is essential to their pathogenesis. In a broader perspective, our laboratory focuses on elucidating the structure and function of chromatin factors and chromatin factor-NCP complexes whose roles are linked to various human diseases. In addition, we are also interested in disease-associated non-chromatin protein targets.

Nucleosome core particle (NCP)



Our research interests



Opportunities

Motivated students with good academic background are encouraged to contact Dr. PS.

Research Publications

15. Davey, GE*, Adhireksan, Z*, Ma, Z*, Riedel, T*, Sharma, D., **Padavattan, S.**, Ludwig, A., Sandin, S., Murray, BS., Dyson, P., Davey, CA. Nucleosome acidic patch-targeting binuclear Ruthenium compound induce aberrant chromatin condensation. (2017) Nature Communications | DOI: 10.1038/s41467-017-01680-4
14. **Sivaraman, P.**, Thiruselvam, V., Shinagawa, T., Hasegawa, K., Kumasaka, T., Ishii, S., Kumarevel, T. Structural analyses of the nucleosome complexes with human testis-specific histone variants, hTh2a and hTh2b. Biophysical chemistry 221 (2017) 41-48.
13. **Padavattan, S.**, Adhireksan, Z., Bao, Q and Davey, C A. X-ray crystallographic analysis of the chromatosome. Acta Cryst A. (2016) A72, s213. (Poster abstract)
12. **Sivaraman, P.**, Shinagawa, T., Hasegawa, K., Kumasaka, T., Ishii, S., Kumarevel, T. Structural and functional analyses of nucleosome complexes with mouse histone variants TH2a and TH2b, involved in reprogramming. Biochemical and Biophysical Research communication 464 (2015) 929-935.
11. Thiruselvam, V., **Sivaraman, P.**, Kumarevel, T., Ponnuswamy, MN. Revelation of endogenously bound Fe²⁺ ions in the crystal structure of ferritin from Escherichia coli. Biochemical and Biophysical Research communication 453 (2014) 636-641.
10. Thiruselvam, V., **Sivaraman, P.**, Kumarevel, T., Ponnuswamy, MN. Crystal structure of the single-stranded RNA binding protein HutP from Geobacillus thermodenitrificans. Biochemical and Biophysical Research communication 446 (2014) 945-951.
9. Shinagawa, T., Takagi, T., Tsukamoto, D., Tomaru, C., Huynh, LM., **Sivaraman, P.**, Kumarevel, T., Inoue, K., Nakato, R., Katou, Y., Sado, T., Takahashi, S., Ogura, A., Shirahige, K., Ishii, S. (2014) Enhancement of reprogramming by histone variant enriched in oocytes. *Cell Stem Cell* 14, 217-227.
8. Tanaka, T*, **Sivaraman, P***, Kumarevel, T. (2012) Crystal structure of archeal chromatin protein Alba2-dsDNA complex from *Aeropyrum pernix* K1. *J Biol Chem* 287, 10394-10402. (* equal contribution)
7. **Sivaraman, P.**, Suresh, M., Subbaraju, GV., Satyanarayana, C., Padmanabhan, B. (2010)

Design of a novel nucleotide analog as potent inhibitor of the NAD⁺ dependent deacetylases, SIRT1 and SIRT2. *Syst Synth Biol* 4:257-263.

6. Markovic-Housley, Z., Basle, A., **Padavattan, S.**, Maderegger, B., Schirmer, T., and Hoffmann-Sommergruber, K. (2009). Structure of the major carrot allergen Dau c 1. *Acta Crystallogr D Biol Crystallogr* 65, 1206-1212.
5. **Padavattan, S.***, Flicker, S*., Schirmer, T., Madritsch, C., Randow, S., Reese, G., Vieths, S., Lupinek, C., Ebner, C., Valenta, R., and Markovic-Housley, Z. (2009). High-affinity IgE recognition of a conformational epitope of the major respiratory allergen Phl p 2 as revealed by X-ray crystallography. *J Immunol* 182, 2141-2151. (* - equal contribution)
4. Minasov, G., **Padavattan, S.**, Shuvalova, L., Brunzelle, J.S., Miller, D.J., Basle, A., Massa, C., Collart, F.R., Schirmer, T., and Anderson, W.F. (2009). Crystal structures of YkuI and its complex with second messenger cyclic Di-GMP suggest catalytic mechanism of phosphodiester bond cleavage by EAL domains. *J Biol Chem* 284, 13174-13184.
3. **Padavattan, S.**, Schmidt, M., Hoffman, D.R., and Markovic-Housley, Z. (2008). Crystal structure of the major allergen from fire ant venom, Sol i 3. *J Mol Biol* 383, 178-185.
2. **Padavattan, S.**, Schirmer, T., Schmidt, M., Akdis, C., Valenta, R., Mittermann, I., Soldatova, L., Slater, J., Mueller, U., and Markovic-Housley, Z. (2007). Identification of a B-cell epitope of hyaluronidase, a major bee venom allergen, from its crystal structure in complex with a specific Fab. *J Mol Biol* 368, 742-752.
1. Kirthi, N., Priyadarshini, C.G., Sharma, P., Maiya, S.P., Hemalatha, V., **Sivaraman, P.**, Dhawan, P., Rishi, N., and Savithri, H.S. (2004). Genetic variability of begomoviruses associated with cotton leaf curl disease originating from India. *Arch Virol* 149, 2047-2057.