**CV Prof. Roger Kornberg**

My research over the past ten years has dealt with the molecular basis of transcription and the development of gold nanoparticles for cryo-electron microscopy (cryo-EM) of the transcription machinery. One series of experiments has shown that the RSC chromatin-remodelling complex is capable of transferring histones from a nucleosome to a histone chaperone. RSC exhibits specificity for the removal of promoter nucleosomes. Cryo-EM revealed an intermediate in which RSC has released DNA from the surface of the nucleosome. Another series of experiments established the basis for the fidelity of transcription and the mechanism of the initiation of transcription. Cryo-EM of a 52-protein transcription initiation complex revealed a fundamental principle of the gene regulatory mechanism. In parallel with these studies, gold nanoparticles were employed to extend the resolution of cryo-EM. This work included the synthesis of the first homogeneous large gold nanoparticles, determination of their atomic structures by X-ray crystallography and aberration-corrected EM, and development of surface chemistry for application to cryo-EM.

* **EDUCATION**

1972 PhD, Chemistry, Stanford University, USA.

* **CURRENT POSITIONS**

2015 - Professor, Department of Biological Chemistry, Hebrew University of Jerusalem, Israel.

1978 - Professor, Department of Structural Biology, School of Medicine, Stanford University, USA.

* **AWARDS** (since 2000)

2016 Foreign Member, Russian Academy of Sciences.

2013 Medal, Federation of European Biochemical Societies.

2012 Honorary degree, St. Petersburg Academic University, Russia.

2011 Frank Westheimer Prize, Harvard University, USA.

2010 Pauling Legacy Award, USA.

2010 Santiago Grisolia Prize, Valencia, Spain.

2008 Aharon Katzir-Katchalsky Award of the IUPAB, Israel.

2008 Ahmed Zewail Prize, Wayne State University, USA.

2008 Honorary Professor, Peking University, China.

2008 Honorary degree, University of Regensburg, Germany.

2006 Dickson Prize, University of Pittsburgh, USA.

2006 Louisa Gross Horwitz Prize, Columbia University, USA.

2006 Nobel Prize in Chemistry.

2005 General Motors Cancer Research Award (Sloan Prize), USA.

2003 Pasarow Award in Cancer Research, USA.

2003 Honorary degree, University of Umea, Sweden.

2003 Massry Prize, USA (shared with M. Grunstein and D. Allis).

2002 Le Grand Prix Charles-Leopold Mayer, Academie de Sciences, France.

2002 Merck Award, American Society for Biochemistry and Molecular Biology (shared with R. Roeder)

2001 Welch Award in Chemistry, Welch Foundation, USA.

2001 Hoppe-Seyler Award, Society for Biochemistry and Molecular Biology, Germany.

2001 Honorary degree, Hebrew University of Jerusalem, Israel.

1. Gairdner International Award, Gairdner Foundation, Canada (shared with R. Roeder).

* **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**
* National Academy of Sciences, USA.
* Japanese Biochemical Society (honorary).
* American Academy of Arts and Sciences.
* Foreign Associate, European Molecular Biology Organization.
* American Philosophical Society.
* Foreign Member, the Royal Society, UK.
* Foreign Member, Korean Academy of Science and Technology.
* Academia Europaea, UK.
* Foreign Member, Russian Academy of Sciences.

***Ten significant publications (last 10 years)***

Azubel, M., Carter, S.D., Weiszmann, J., Zhang, J., Jensen, G.J., Li, Y., and **Kornberg**, R.D. (2019) Imaging FGF-FGF receptor complexes *in vivo* by cryo-electron tomography. **Elife**. Jan 28;8. pii: e43146.

Lorch, Y., Maier-Davis, B., and **Kornberg**, R.D. (2018) Histone acetylation inhibits RSC and stabilizes the +1 nucleosome. **Mol. Cell**. 72:594-600.

Azubel, M., Koh, A.L., Koyasu, K., Tsukuda, T., and **Kornberg**, R.D. (2017) Structure determination of a water-soluble 144-gold atom particle at atomic resolution by aberration-corrected electron microscopy**.** [**ACS Nano.**](https://www.ncbi.nlm.nih.gov/pubmed/29136369) 11:11866-71.

Robinson, P.J., Trnka, M.J., Bushnell, D.A., Pellarin, R., Davis, R., Mattei, P.-J., Burlingame, A.L., and **Kornberg**, R.D. (2016) Structure of a complete mediator-RNA polymerase II pre-initiation complex. **Cell** 166:1411-22.

Nagai, S., Eagen, K.P., and **Kornberg**, R.D. (2016) Chromatin potentiates transcription. **Proc. Natl. Acad. Sci. USA.** 114:1536-41.

Azubel, M., Koivisto, J., Malola, S., Bushnell, D.A., Hura, G.L., Koh, A.L., Tsunoyama, H., Tsukuda, T., Pettersson, M., Häkkinen, H.,and **Kornberg**, R.D. (2014) Electron microscopy at atomic resolution. **Science** 345:909-12.

Murakami, K., Elmlund H, Kalisman, N., Bushnell, D.A., Adams, C.M., Azubel, M., Elmlund, D., Levi-Kalisman, Y., Liu, X., Gibbons, B.J., Levitt, M., and **Kornberg,** R.D. (2013) Architecture of an RNA polymerase II transcription pre-initiation complex. **Science** 342:709.

Lorch, Y., Griesenbeck, J., Boeger, H., Maier-Davis, B., and **Kornberg**, R.D. (2011) Selective removal of promoter nucleosomes by the RSC chromatin remodeling complex. **Nat. Struct. Mol. Biol.** 18:881-5.

Liu, X., Bushnell, D.A., Silva, D.A., Huang, X., and **Kornberg**, R.D. (2011) Initiation complex structure and promoter proofreading**. Science** 333:633-7.

Liu, X., Bushnell, D.A., Wang, D., Calero, G., and **Kornberg**, R.D. (2010) Structure of an RNA polymerase II-TFIIB complex and the transcription initiation mechanism. **Science** 327:206-209.