Diego Loayza, Assistant Professor

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Education:

- PostDoc Rockefeller University
- Ph.D. 1998 John Hopkins School of Medicine
- MA 1992 Princeton University
- BS 1990 University of Geneva

Research Interest:

- **Telomere Function in Human Cells**

Human chromosome ends (telomeres) are composed of long stretches of TTAGGG repeats and end with a ~150 single stranded overhang. Telomere integrity is essential for chromosome stability and cellular proliferation. As a normal process, telomeres shorten at each cell division until they are too short to sustain growth, at which point cells undergo an

irreversible arrest called senescence. Senescence can be completely bypassed by forced expression of telomerase, the enzyme that synthesizes the telomeric repeats, which provides cells with infinite replicative potential.

- Proteins that bind to telomeres regulate their length and ensure their protection. A complex of six proteins, named shelterin, is critical for telomere function: TRF1, TRF2, Tin2, Rap1, TPP1 and POT1. In the laboratory, we are studying the role of POT1 at telomeres: this component can regulate the activity of telomerase at chromosome ends. POT1 binds specifically to the telomeric overhang, and this activity is essential for inhibiting telomere elongation in cis. It is the relationship between shelterin, POT1 and telomerase in human cells that constitutes the prime focus of the laboratory.

Selected Publications:

- J. Ye, D. Hockemeyer, A.N. Krutchinsky, D. Loayza, S.M. Hooper, B.T. Chait, and T. de Lange (2004) POT1 Interacting Protein PIP1: a telomere length regulator that recruits POT1 to the TIN2/TRF1 complex. Genes and Development 18:1649. [TPP1 recruits POT1 and bridges it with Tin2 (note: TPP1 is named PIP1, PTOP and Tint1 in certain publications)].
- D. Loayza, H. Parsons, J. Donigian, K. Hoke and T. de Lange (2003) DNA binding features of human POT1. J.Biol.Chem. (2004) 279:13241. [minimal binding site for POT1 binding to single stranded DNA + some DNA binding features].
- D. Loayza and T. de Lange (2003) POT1 as a terminal transducer of TRF1 telomere length control. Nature 423:1013. [deletion of the DNA binding domain of POT1 does not affect recruitment to telomeres but leads to extensive telomere elongation].