

# Stanford

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## Mark Krasnow

Professor of Biochemistry

### CONTACT INFORMATION

- **Alternate Contact**

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### Bio

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### ACADEMIC APPOINTMENTS

- Professor, Biochemistry
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

### ADMINISTRATIVE APPOINTMENTS

- Executive Director, Wall Center for Pulmonary Vascular Disease, (2010- present)
- Chair, Dept. of Biochemistry, Stanford University School of Medicine, (2006-2013)
- Associate Chair, Dept. of Biochemistry, Stanford University School of Medicine, (2000-2006)
- Investigator, Howard Hughes Medical Institute, (1997- present)
- Director, Medical Scientist Training Program, (1996-2002)

### HONORS AND AWARDS

- Paul and Mildred Berg Professor, Stanford University (2018)
- Member, National Academy of Medicine (2016)
- Fellow, American Academy of Arts & Sciences (2009)
- Fellow, American Association for the Advancement of Science (1998)
- Recipient, Presidential Young Investigator Award (1991-1997)
- Recipient, Lucille P. Markey Scholar Award (1987-1993)

### LINKS

- Krasnow Lab: <http://cmgm.stanford.edu/krasnow/>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

- Lung development and stem cells
- Neural circuit of breathing
- Lung diseases including lung cancer
- New genetic model organisms for medicine

## Teaching

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### COURSES

#### 2018-19

- Developing an Original Research Proposal: BIOC 360 (Sum)
- Molecular Foundations of Medicine: BIOC 205 (Aut)

#### 2017-18

- Molecular Foundations of Medicine: BIOC 205 (Aut)

#### 2016-17

- Molecular Foundations of Medicine: BIOC 205 (Aut)

#### 2015-16

- Molecular Foundations of Medicine: BIOC 205 (Aut)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

Jude Lee, Gergana Vandova

#### Postdoctoral Faculty Sponsor

Stephen Chang, SoRi Jang, Caitlin Karanewsky, Yin Liu, Andrea Yung

#### Doctoral Dissertation Advisor (AC)

Stephen Chang

### GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biochemistry (Phd Program)
- Cancer Biology (Phd Program)
- Medicine (Masters Program)
- Neonatal-Perinatal Medicine (Fellowship Program)
- Pediatric Pulmonology (Fellowship Program)
- Pulmonary & Critical Care Medicine (Fellowship Program)
- Sleep Medicine (Fellowship Program)

## Publications

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### PUBLICATIONS

- **Single-cell Wnt signaling niches maintain stemness of alveolar type 2 cells.** *Science (New York, N.Y.)*

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Nabhan, A., Brownfield, D. G., Harbury, P. B., Krasnow, M. A., Desai, T. J.  
2018

- **The Mouse Lemur, a Genetic Model Organism for Primate Biology, Behavior, and Health.** *Genetics*  
Ezran, C., Karanewsky, C. J., Pendleton, J. L., Sholtz, A., Krasnow, M. R., Willick, J., Razafindrakoto, A., Zohdy, S., Albertelli, M. A., Krasnow, M. A.  
2017; 206 (2): 651-664
- **Breathing control center neurons that promote arousal in mice** *SCIENCE*  
Yackle, K., Schwarz, L. A., Kam, K., Sorokin, J. M., Huguenard, J. R., Feldman, J. L., Luo, L., Krasnow, M. A.  
2017; 355 (6332): 1411-1415
- **The peptidergic control circuit for sighing** *NATURE*  
Li, P., Janczewski, W. A., Yackle, K., Kam, K., Pagliardini, S., Krasnow, M. A., Feldman, J. L.  
2016; 530 (7590): 293-?
- **Oxygen regulation of breathing through an olfactory receptor activated by lactate** *NATURE*  
Chang, A. J., Ortega, F. E., Riegler, J., Adison, D. V., Krasnow, M. A.  
2015; 527 (7577): 240-?
- **Formation of a Neurosensory Organ by Epithelial Cell Slithering** *CELL*  
Kuo, C. S., Krasnow, M. A.  
2015; 163 (2): 394-405
- **Subcellular Trafficking of FGF Controls Tracheal Invasion of Drosophila Flight Muscle** *CELL*  
Peterson, S. J., Krasnow, M. A.  
2015; 160 (1-2): 313-323
- **Mesenchymal cells. Defining a mesenchymal progenitor niche at single-cell resolution.** *Science*  
Kumar, M. E., Bogard, P. E., Espinoza, F. H., Menke, D. B., Kingsley, D. M., Krasnow, M. A.  
2014; 346 (6211)
- **Reconstructing lineage hierarchies of the distal lung epithelium using single-cell RNA-seq.** *Nature*  
Treutlein, B., Brownfield, D. G., Wu, A. R., Neff, N. F., Mantalas, G. L., Espinoza, F. H., Desai, T. J., Krasnow, M. A., Quake, S. R.  
2014; 509 (7500): 371-375
- **Alveolar progenitor and stem cells in lung development, renewal and cancer.** *Nature*  
Desai, T. J., Brownfield, D. G., Krasnow, M. A.  
2014; 507 (7491): 190-194
- **Progenitor Outgrowth from the Niche in Drosophila Trachea Is Guided by FGF from Decaying Branches** *SCIENCE*  
Chen, F., Krasnow, M. A.  
2014; 343 (6167): 186-189
- **Radial Construction of an Arterial Wall** *DEVELOPMENTAL CELL*  
Greif, D. M., Kumar, M., Lighthouse, J. K., Hum, J., An, A., Ding, L., Red-Horse, K., Espinoza, F. H., Olson, L., Offermanns, S., Krasnow, M. A.  
2012; 23 (3): 482-493
- **Coronary arteries form by developmental reprogramming of venous cells** *NATURE*  
Red-Horse, K., Ueno, H., Weissman, I. L., Krasnow, M. A.  
2010; 464 (7288): 549-U100
- **Dual origin of tissue-specific progenitor cells in Drosophila tracheal remodeling** *SCIENCE*  
Weaver, M., Krasnow, M. A.  
2008; 321 (5895): 1496-1499
- **The branching programme of mouse lung development** *NATURE*  
Metzger, R. J., Klein, O. D., Martin, G. R., Krasnow, M. A.  
2008; 453 (7196): 745-U1
- **Social interactions among epithelial cells during tracheal branching morphogenesis** *NATURE*  
Ghabrial, A. S., Krasnow, M. A.

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2006; 441 (7094): 746-749

- **Tube morphogenesis: Making and shaping biological tubes** *CELL*  
Lubarsky, B., Krasnow, M. A.  
2003; 112 (1): 19-28
- **Branching morphogenesis of the Drosophila tracheal system** *ANNUAL REVIEW OF CELL AND DEVELOPMENTAL BIOLOGY*  
Ghabrial, A., Luschnig, S., Metzstein, M. M., Krasnow, M. A.  
2003; 19: 623-647
- **Development - Genetic control of branching morphogenesis** *SCIENCE*  
Metzger, R. J., Krasnow, M. A.  
1999; 284 (5420): 1635-1639
- **The role of Olf78 in the breathing circuit of mice Reply** *NATURE*  
Chang, A. J., Kim, N. S., Hireed, H., de Arce, A., Ortega, F. E., Riegler, J., Madison, D. V., Krasnow, M. A.  
2018; 561 (7724): E41
- **Profile of an unknown airway cell** *NATURE*  
Travaglini, K. J., Krasnow, M. A.  
2018; 560 (7718): 313-14
- **Single-cell transcriptomics of 20 mouse organs creates a Tabula Muris.** *Nature*  
2018; 562 (7727): 367-72
- **Developmental origin of lung macrophage diversity** *DEVELOPMENT*  
Tan, S. Y., Krasnow, M. A.  
2016; 143 (8): 1318-1327
- **Small Cell Lung Cancer: Can Recent Advances in Biology and Molecular Biology Be Translated into Improved Outcomes?** *Journal of thoracic oncology*  
Bunn, P. A., Minna, J. D., Augustyn, A., Gazdar, A. F., Ouadah, Y., Krasnow, M. A., Berns, A., Brambilla, E., Rekhtman, N., Massion, P. P., Niederst, M., Peifer, M., Yokota, et al  
2016; 11 (4): 453-474
- **Two nested developmental waves demarcate a compartment boundary in the mouse lung** *NATURE COMMUNICATIONS*  
Alanis, D. M., Chang, D. R., Akiyama, H., Krasnow, M. A., Chen, J.  
2014; 5
- **Myb promotes centriole amplification and later steps of the multiciliogenesis program** *DEVELOPMENT*  
Tan, F. E., Vladar, E. K., Ma, L., Fuentealba, L. C., Hoh, R., Espinoza, F. H., Axelrod, J. D., Alvarez-Buylla, A., Stearns, T., Kintner, C., Krasnow, M. A.  
2013; 140 (20): 4277-4286
- **A Genome-Wide Association Study (GWAS) for Bronchopulmonary Dysplasia.** *Pediatrics*  
Wang, H., St Julien, K. R., Stevenson, D. K., Hoffmann, T. J., Witte, J. S., Lazzeroni, L. C., Krasnow, M. A., Quintance, C. C., Oehlert, J. W., Jelliffe-Pawlowski, L. L., Gould, J. B., Shaw, G. M., O'Brodovich, et al  
2013; 132 (2): 290-297
- **High quality genome-wide genotyping from archived dried blood spots without DNA amplification.** *PloS one*  
St Julien, K. R., Jelliffe-Pawlowski, L. L., Shaw, G. M., Stevenson, D. K., O'Brodovich, H. M., Krasnow, M. A.  
2013; 8 (5)
- **Integrin Beta 1 Suppresses Multilayering of a Simple Epithelium** *PLOS ONE*  
Chen, J., Krasnow, M. A.  
2012; 7 (12)
- **A Systematic Screen for Tube Morphogenesis and Branching Genes in the Drosophila Tracheal System** *PLOS GENETICS*  
Ghabrial, A. S., Levi, B. P., Krasnow, M. A.  
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- **Targeting Robo4-Dependent Slit Signaling to Survive the Cytokine Storm in Sepsis and Influenza** *SCIENCE TRANSLATIONAL MEDICINE*

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- London, N. R., Zhu, W., Bozza, F. A., Smith, M. C., Greif, D. M., Sorensen, L. K., Chen, L., Kaminoh, Y., Chan, A. C., Passi, S. F., Day, C. W., Barnard, D. L., Zimmerman, et al  
2010; 2 (23)
- **Circulating blood cells function as a surveillance system for damaged tissue in *Drosophila* larvae** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Babcock, D. T., Brock, A. R., Fish, G. S., Wang, Y., Perrin, L., Krasnow, M. A., Galiko, M. J.  
2008; 105 (29): 10017-10022
  - **Functions of the nonsense-mediated mRNA decay pathway in *Drosophila* development** *PLOS GENETICS*  
Metzstein, M. M., Krasnow, M. A.  
2006; 2 (12): 2143-2154
  - ***Drosophila* talin and integrin genes are required for maintenance of tracheal terminal branches and luminal organization (vol 133, pg 2383, 2006)** *DEVELOPMENT*  
Levi, B. P., Ghabrial, A. S., Krasnow, M. A.  
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  - **Genome-wide identification of mRNAs associated with the translational regulator PUMILIO in *Drosophila melanogaster*** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Gerber, A. P., Luschnig, S., Krasnow, M. A., Brown, P. O., Herschlag, D.  
2006; 103 (12): 4487-4492
  - **Sprouty proteins are in vivo targets of Corkscrew/SHP-2 tyrosine phosphatases** *DEVELOPMENT*  
Jarvis, L. A., Toering, S. J., Simon, M. A., Krasnow, M. A., Smith-Bolton, R. K.  
2006; 133 (6): 1133-1142
  - **serpentine and vermiform encode matrix proteins with chitin binding and deacetylation domains that limit tracheal tube length in *Drosophila*** *CURRENT BIOLOGY*  
Luschnig, S., Batz, T., Armbruster, K., Krasnow, M. A.  
2006; 16 (2): 186-194
  - **Requirement for chitin biosynthesis in epithelial tube morphogenesis** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Devine, W. P., Lubarsky, B., Shaw, K., Luschnig, S., Messina, L., Krasnow, M. A.  
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  - **Cellular and genetic analysis of wound healing in *Drosophila* larvae** *PLOS BIOLOGY*  
Galiko, M. J., Krasnow, M. A.  
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  - **Gene expression during the life cycle of *Drosophila melanogaster*** *SCIENCE*  
Arbeitman, M. N., Furlong, E. E., Imam, F., JOHNSON, E., Null, B. H., Baker, B. S., Krasnow, M. A., Scott, M. P., Davis, R. W., White, K. P.  
2002; 297 (5590): 2270-2275
  - **Tube morphogenesis** *TRENDS IN CELL BIOLOGY*  
Krasnow, M. A., Nelson, W. J.  
2002; 12 (8): 351-351
  - **Developmental control of blood cell migration by the *Drosophila* VEGF pathway** *CELL*  
Cho, N. K., Keyes, L., JOHNSON, E., Heller, J., Ryner, L., Karim, F., Krasnow, M. A.  
2002; 108 (6): 865-876
  - **The *Drosophila* ribbon gene encodes a nuclear BTB domain protein that promotes epithelial migration and morphogenesis** *DEVELOPMENT*  
Shim, K., Blake, K. J., Jack, J., Krasnow, M. A.  
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  - **A nuclear lamin is required for cytoplasmic organization and egg polarity in *Drosophila*** *NATURE CELL BIOLOGY*  
Guillemin, K., Williams, T., Krasnow, M. A.  
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- **Genetic dissection of epithelial branching and oxygen response pathways in *Drosophila*.**  
JOHNSON, E., Chiu, S. K., Jarecki, J., Krasnow, M. A.  
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- **Inhibition of angiogenesis by a mouse sprouty protein** *JOURNAL OF BIOLOGICAL CHEMISTRY*  
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- **Genetic control of epithelial tube size in the *Drosophila* tracheal system** *DEVELOPMENT*  
Beitel, G. J., Krasnow, M. A.  
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Kornberg, T. B., Krasnow, M. A.  
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- **Oxygen regulation of airway branching in *Drosophila* is mediated by branchless FGF** *CELL*  
Jarecki, J., JOHNSON, E., Krasnow, M. A.  
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Minowada, G., Jarvis, L. A., Chi, C. L., Neubuser, A., Sun, X., Hacohen, N., Krasnow, M. A., Martin, G. R.  
1999; 126 (20): 4465-4475
- **Genetic control of branching morphogenesis.** *Science*  
Metzger, R. J., Krasnow, M. A.  
1999; 284 (5420): 1635-1639
- **Sprouty: a common antagonist of FGF and EGF signaling pathways in *Drosophila*** *DEVELOPMENT*  
Kramer, S., Okabe, M., Hacohen, N., Krasnow, M. A., Hiromi, Y.  
1999; 126 (11): 2515-2525
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Imam, F., Sutherland, D., Huang, W., Krasnow, M. A.  
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- **Adrift, a novel *bnl*-induced *Drosophila* gene, required for tracheal pathfinding into the CNS** *DEVELOPMENT*  
Englund, C., Uv, A. E., Cantera, R., Mathies, L. D., Krasnow, M. A., Samakovlis, C.  
1999; 126 (7): 1505-1514
- **Oxygen regulation of tracheal branching is mediated by the branchless fibroblast growth factor**  
JOHNSON, E., Krasnow, M.  
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- **sprouty encodes a novel antagonist of FGF signaling that patterns apical branching of the *Drosophila* airways** *CELL*  
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1998; 92 (2): 253-263
- **Patterning of airway branching in *Drosophila* by FGF.**  
Krasnow, M. A., Chiu, S. K., Hacohen, N., Guillemin, K., Jarecki, J., JOHNSON, E., Schneider, D., Shim, K., Sutherland, D., Toering, S.  
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- **The hypoxic response: Huffing and HIFing** *CELL*  
Guillemin, K., Krasnow, M. A.  
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- **Genes that control organ form: Lessons from bone and branching morphogenesis** *Cold Spring Harbor Symposium on Quantitative Biology - Pattern Formation During Development*  
Krasnow, N. A.  
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Sutherland, D., Samakovlis, C., Krasnow, M. A.  
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- **Regulated Breathless receptor tyrosine kinase activity required to pattern cell migration area branching in the Drosophila tracheal system** *GENES & DEVELOPMENT*  
Lee, T., Hacohen, N., Krasnow, M., Montell, D. J.  
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- **Genetic control of epithelial tube fusion during Drosophila tracheal development** *DEVELOPMENT*  
Samakovlis, C., Manning, G., Steneberg, P., Hacohen, N., Cantera, R., Krasnow, M. A.  
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- **The Drosophila Serum Response Factor gene is required for the formation of intervein tissue of the wing and is allelic to blistered** *DEVELOPMENT*  
Montagne, J., Groppe, J., Guillemin, K., Krasnow, M. A., Gehring, W. J., Affolter, M.  
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- **Development of the Drosophila tracheal system occurs by a series of morphologically distinct but genetically coupled branching events** *DEVELOPMENT*  
Samakovlis, C., Hacohen, N., Manning, G., Sutherland, D. C., Guillemin, K., Krasnow, M. A.  
1996; 122 (5): 1395-1407
- **The pruned gene encodes the Drosophila serum response factor and regulates cytoplasmic outgrowth during terminal branching of the tracheal system** *DEVELOPMENT*  
Guillemin, K., Groppe, J., Ducker, K., Treisman, R., Hafen, E., Affolter, M., Krasnow, M. A.  
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- **A novel circadianly expressed Drosophila melanogaster gene dependent on the period gene for its rhythmic expression** *EMBO JOURNAL*  
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- **Partners in time. Circadian rhythms.** *Current biology*  
Van Gelder, R. N., Krasnow, M. A.  
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- **Circadian rhythms: Partners in time** *CURRENT BIOLOGY*  
VANGELDER, R. N., Krasnow, M. A.  
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- **Extent and character of circadian gene expression in Drosophila melanogaster: Identification of twenty oscillating mRNAs in the fly head** *CURRENT BIOLOGY*  
VANGELDER, R. N., Bae, H., Palazzolo, M. J., Krasnow, M. A.  
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- **EXTRADENTICLE PROTEIN IS A SELECTIVE COFACTOR FOR THE DROSOPHILA HOMEOTICS - ROLE OF THE HOMEODOMAIN AND YPWM AMINO-ACID MOTIF IN THE INTERACTION** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
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- **A DIFFERENTIAL RESPONSE ELEMENT FOR THE HOMEOTICS AT THE ANTENNAPEDIA P1 PROMOTER OF DROSOPHILA** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
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- **PREPARATION AND ANALYSIS OF PURE CELL-POPULATIONS FROM DROSOPHILA** *METHODS IN CELL BIOLOGY, VOL 44*  
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- **INTERCELLULAR SIGNALING IN DROSOPHILA SEGMENT FORMATION RECONSTRUCTED INVITRO** *NATURE*  
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- **DIFFERENTIAL REGULATION OF TRANSCRIPTION PREINITIATION COMPLEX ASSEMBLY BY ACTIVATOR AND REPRESSOR HOMEODOMAIN PROTEINS** *GENES & DEVELOPMENT*  
Johnson, F. B., Krasnow, M. A.  
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Krasnow, M. A., Cumberledge, S., Manning, G., Herzenberg, L. A., Nolan, G. P.  
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- **STIMULATION OF TRANSCRIPTION BY AN ULTRABITHORAX PROTEIN INVITRO** *GENES & DEVELOPMENT*  
Johnson, F. B., Krasnow, M. A.  
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- **TRANSCRIPTIONAL ACTIVATION BY THE ANTENNAPEPIA AND FUSHI-TARAZU PROTEINS IN CULTURED DROSOPHILA CELLS** *CELL*  
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- **Transcriptional regulation by homeotic gene products in cultured Drosophila cells and in vitro** *Current Communications in Molecular Biology, Cold Spring Harbor Press*  
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Benjamin, H. W., Matzuk, M. M., Krasnow, M. A., Cozzarelli, N. R.  
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Krasnow, M.A., Matzuk, M.M., Dugan, J.M., Benjamin, H.W., Cozzarelli, N.R.  
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Krasnow, M. A., Cozzarelli, N. R.



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Krasnow, M.A., Cozzarelli, N.R.

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- **ESCHERICHIA-COLI TYPE-1 TOPOISOMERASES - IDENTIFICATION, MECHANISM, AND ROLE IN RECOMBINATION** *COLD SPRING HARBOR SYMPOSIA ON QUANTITATIVE BIOLOGY*

Dean, F., Krasnow, M. A., Otter, R., Matzuk, M. M., Spengler, S. J., Cozzarelli, N. R.

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