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Cell Growth and Cancer Program

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Dr. El-Deiry's Hematology/Oncology web

RESEARCH INTERESTS

1. p53 and TRAIL signaling
2. Novel anti-cancer therapeutics
3. In vivo molecular imaging

Key words: P53, apoptosis, transcription, cancer, p21, TRAIL, GI cancer, drug resistance, in-vivo bioluminescence imaging, BRCA1, transformation, repair, caspase activation, tumor suppression.

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DESCRIPTION OF RESEARCH

The major interest of the lab in recent years has been to understand the mechanism of action of the tumor suppressor p53 and the contribution of its downstream target genes to cellular growth control. Analysis of this pathway led to our identification of a number of genes directly regulated by p53 and which can inhibit cell cycle progression (p21WAF1), induce apoptosis (KILLER/DR5, Bid, caspase 6, Traf4 and others) or activate DNA repair (DDB2). Insights have emerged into the tissue specificity of the DNA damage response in vivo as well as into the mechanism by which wild-type p53 sensitizes cells to killing by anti-cancer drugs. Efforts have been directed at understanding regulation of p53 activity through control of its stability as well as its selectivity in target gene activation. An area of focus in the lab that emerged from our work on p53 involves analysis of the extrinsic cell death pathway and its activation by the death ligand TRAIL. Our work on the TRAIL pathway has involved analysis of mechanisms of sensitivity and resistance of cancer cells, exploration of intracellular signaling events involved in regulating caspase activation and studies of how cell death occurs with respect to mitochondrial involvement.

A new direction for the lab within the last couple of years has involved the development and application of non-invasive in vivo imaging technologies for cancer research. We have used bioluminescence and fluorescence to image tumors in vivo as well as molecular events occurring within the tumors including chemotherapy-induced gene expression changes. Other exciting applications include the ability to image protein-protein interaction in vivo and the ability to image the effects of genetic changes on tumor cell transformation and tumor growth in vivo.

RECENT PUBLICATIONS

McDonald, E.R., III, and El-Deiry, W.S. Suppression of caspase-8- and -10-associated RING proteins results in sensitization to death ligands and inhibition of tumor cell growth. *Proc. Natl. Acad. Sci. USA*, 101:6170-6175, 2004.

Ricci, M.S., Jin, Z., Dews, M., Yu, D., Thomas-Tikhonenko, A., Dicker, D.T., and El-Deiry, W.S. Direct repression of FLIP expression by c-myc is a major determinant of TRAIL sensitivity. *Mol. Cell. Biol.*, 24:8541-8555, 2004.

Fei, P., Wang, W., Kim, S-H., Wang, S., Burns, T.F., Sax, J.K., Buzzai, M., Dicker, D.T., McKenna, W.G., Bernhard, E.J., and El-Deiry, W.S. Bnip3L is

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Cancer Biology and Therapy (A peer reviewed journal edited by Dr. El-Deiry)

ISI Interview with Dr. El-Deiry

Tumor Suppressor Genes (A 2 volume text edited by Dr. El-Deiry):

Dr. El-Deiry's BMB graduate group page

Dr. El-Deiry's Pharmacology group page

Highly Cited Researcher

Education

University of Miami: BS (Chemistry), 1981.

University of Miami School of Medicine: Ph.D. (Biochemistry), 1987.

University of Miami School of Medicine: M.D., 1987.

Johns Hopkins University: Post-graduate training (Internal Medicine, Oncology, Molecular Genetics of Cancer), 1987-1994.

induced by p53 under hypoxia and its knockdown promotes tumor growth. *Cancer Cell*, 6:597-609, 2004.

Finnberg, N., Gruber, J.J., Fei, P., Rudolph, D., Bric, A., Burns, T.F., Ajuha, H., Page, R., Wu, G.S., Chen, Y., McKenna, W.G., Bernhard, E.J., Lowe, S.W., Mak, T.W., and El-Deiry, W.S. DR5 knock-out mice are compromised in radiation-induced apoptosis. *Mol. Cell. Biol.*, 25:2000-13, 2005.

Dash, B.C., and El-Deiry, W.S. G2/M-dependent phosphorylation of p21 promotes assembly and cdc2 kinase activity. *Mol. Cell. Biol.*, 25:3364-3387, 2005.

Lab

ROTATION PROJECTS FOR 2005-2006

Please make an appointment to discuss ongoing work and available projects.

Lab personnel:

Joe Ackerman, Ph.D., Post-doctoral Scientist
Kristina Carroll, Undergraduate Student
Bipin Dash, Ph.D., Post-doctoral Scientist
David T. Dicker, Research Specialist
Jay Dorsey, M.D. Ph.D., Post-doctoral Scientist
Niklas Finnberg, Ph.D., Post-doctoral Scientist
Seok-Hyun Kim, M.D. Ph.D., Post-doctoral Scientist
Judy Liu, Undergraduate Vagelos Scholar
Yvette Liu, Imaging Specialist
Elizabeth Matthew, Ph.D., Post-doctoral Scientist
Patrick Mayes, Graduate Rotation Student
Akiva Mintz, M.D. Ph.D., Post-doctoral Scientist
Arunasalam Navaraj, Ph.D., Post-doc. Scientist
Shannone Nicolson, Administrative Assistant
Kazuhiro Ogi, M.D. Ph.D., Post-doctoral Scientist
John Plastaras, M.D. Ph.D., Post-doctoral Scientist
Nita S. Prabhu, M.S., Part-time Technician
M. Stacey Ricci, Sc.D., Post-doctoral Scientist
Laura Rozan, Ph.D., Post-doctoral Scientist
Kimberly Scata, Ph.D., Post-doctoral Scientist
Nanette Soto, Visiting Medical Student
Shulin Wang, M.D. Ph.D., Post-doctoral Scientist
Wenge Wang, M.D. Ph.D., Post-doctoral Scientist
Wensheng Yang, Ph.D., Post-doctoral Scientist

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