Evripidis Gavathiotis, Ph.D.

Positions:
Professor, Department of Biochemistry
Professor, Department of Medicine
Co-Leader, Cancer Therapeutics Program, Albert Einstein Cancer Center
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Research interests:
My laboratory aims to investigate protein interaction mechanisms that govern cell death and survival signaling pathways and are deregulated in cancer and other diseases. We focus on understanding the protein interaction network of the BCL-2 family of proteins that regulates apoptosis, necrosis, mitochondrial physiology, autophagy and senescence and ultimately the delicate balance between cellular life and death. Our research approach is at the interface of chemistry and biology combining methodologies from chemical biology, structural biology, cellular biology and pharmacology. Our ultimate goal is to translate our mechanistic insights of protein interactions into novel pharmacological strategies and chemical probes that modulate these interactions for the development of novel therapeutics. Our interest in stem cell biology focuses on understanding the role of BCL-2 proteins in regulating cell death, survival and differentiation of normal and cancer stem cells and developing therapeutic strategies modulating their cell fate.

Current grant funding:

R01CA178394-07 NIH/NCI	(PI: Gavathiotis)	6/1/2020 - 5/30/2025 Small Molecule Activators of Pro-apoptotic BAX for Cancer Therapy
PR191593P1 DOD	(PI: Gavathiotis)	7/1/2020 - 6/30/2023 Development of Small Molecule BAX Inhibitors to Prevent Cancer Therapy-Induced Cardiomyopathy
R01CA223243 NIH/NCI	(PI: Gavathiotis)	12/2/2019 - 12/1/2024 Allosteric inhibitors targeting oncogenic BRAFV600E

Recent publications (selected):

1. Lopez A, Reyna DE, Gitego N, Zhou H, Kopp F, Miranda M, Narayanagari S, Chi P, Vilar E, Tsirigos A, **Gavathiotis E**. Co-targeting of BAX and BCL-XL proteins broadly overcomes resistance to apoptosis in cancer. **Nature Communications.** 2022
2. Bourdenx M, Rodriguez-Navarro JA, Tasset I, Diaz A, Kaushik S, Storm NJ, Xin Q, Stevenson E, Luengo,E Clement C, Choi SJ, Krogan NJ, Mosharov EV, Santambrogio L, Grueninger F, Collin L, Swaney DL, Sulzer D, **Gavathiotis E***, Cuervo AM*. Chaperone-mediated autophagy prevents collapse of the neuronal metastable proteome. **Cell** 2021, 184:2696-2714.
3. Spitz AZ, Zacharioudakis E, Reyna DE, Garner TP, **Gavathiotis E.** Eltrombopag directly inhibits BAX and prevents cell death. **Nature Communications.** 2021**,** 12:1134.
4. Cotto-Rios X, Agianian B, Gitego, N, Zacharioudakis E, Giricz O, Wu Y, Yiyu, Z, Verma A, Poulikakos PI**, Gavathiotis E.** Inhibitors of BRAF dimers using an allosteric site. **Nature Communications.** 2020, 11: 4370
5. Amgalan D, Garner TP, Pekson R, Jia XF, Yanamandala M, Paulino V, Liang FG, Corbalan JJ, Lee J, Chen Y, Karagiannis GS, Sanchez LR, Liang H, Narayanagari SR, Mitchell K, Lopez A, Margulets V, Scarlata M, Santulli G, Asnani A, Peterson R, Hazan RB, Condeelis JS, Oktay MH, Steidl U, Kirshenbaum L, **Gavathiotis E***, Kitsis RN*. Small molecule allosteric inhibition of BAX protects against doxorubicin-induced cardiomyopathy. **Nature Cancer.** 2020, 1:315-328.
6. Rocha GA, Franco F, Krezel A, Rumsey JM, Alberti JM, Knight WC, Biris N, Zacharioudakis E, Janetka JW, Baloh BH, Kitsis RN, Mochly-Rosen D, Townsend RR, **Gavathiotis E**, Dorn GW. Mfn2 agonists reverse mitochondrial defects in preclinical models of Charcot Marie Tooth disease type 2A. **Science** 2018**,** 360: 336-341
7. Reyna DE, Garner TP, Lopez A, Kopp F, Choudhary GS, Sridharan A, Narayanagari SR, Mitchell K, Dong B, Bartholdi BA, Verma A, Steidl U, **Gavathiotis E.** Direct Activation of BAX by BTSA1 Overcomes Apoptosis Resistance in Acute Myeloid Leukemia. **Cancer Cell** (2017) 32: 1-15