**CHRISTINE CHIO**

**Overview**

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**Academic Appointments**

* Assistant Professor of Genetics & Development

**Administrative Titles**

**Research**

Christine Chio studies Pancreatic ductal adenocarcinoma (PDAC) that represents the third leading cause of cancer death in the United States. Lethality of PDA owes largely to the advanced disease stage at the time of diagnosis and to its profound resistance to existing therapies. Targeted therapy is a cornerstone of precision medicine, and is currently the focus of much anticancer drug development. However, in the context of pancreatic cancer, no chemical inhibitors exist for the most common KRAS mutations (G12D, G12V) even though it is well established that the oncogenic KRAS promotes drug resistance. Thus, a detailed understanding of the role of specific genetic lesions and their signaling surrogates in the initiation and progression of PDA is critical to improving treatment efficacy and patient outcome for this disease. Using genetically engineered mouse models and ex vivo 3D culture systems, the Chio lab seeks to understand the basic mechanisms underlying PDAC biology such that vulnerabilities can be identified and tested for therapeutic intervention.

For more information please visit www.chiolab.com

**Selected Publications**

*Invited Review Articles*

1. Yang, X, **Chio II**. PDA got SERious Nerves. ***Trends in Cancer.*** 2020; 10.1016/j.trecan.2020.12.004
2. Ayres Pereira M, Chio II. Metastasis in Pancreatic Cancer: advances in the field and methodologies. *Genes*. *2019*; 11 (1), 6
3. **Chio II**, Tuveson DA. ROS in Cancer: The Burning Question. ***Trends in Molecular Medicine***. 2017. 2017; 23(5):411-429

*Primary Research Articles*

1. Chan KM, Robert F, Oertlin C, Kapeller-Libermann, D, Avizonis D, Park J, Schoepfer C, Da Silva B, Yao M, Gorton F, Thomas C, Brown L, Porco J, Doubrovin M, Pollak M, Larsson O, Pelletier J, **Chio II.** eIF4A-dependent translational control of central carbon metabolism in pancreatic ductal adenocarcinoma. ***Nature Communications****. 2019*; 10, 5151
2. **Chio, II,** Jafarnejad SM, Ponz-Sarvise M, Park Y, Rivera K, Palm W, Wilson J, Sangar V, Hao Y, Ohlund D, Wright K, Filippini D, Lee EJ, Da Silva B, Schoepfer C, Wilkinson JE, Buscaglia JM, DeNicola GM, Tiriac H, Hammell M, Crawford HC, Schmidt EE, Thompson CB, Pappin DJ, Sonenberg N, Tuveson DA. NRF2 Promotes Tumor Maintenance by Modulating mRNA Translation in Pancreatic Cancer. ***Cell***. 2016;166(4):963-76.
3. Boj SF\*, Hwang CI\*, Baker LA\*, **Chio, II\***, Engle DD\*, Corbo V\*, Jager M, Ponz-Sarvise M, Tiriac H, Spector MS, Gracanin A, Oni T, Yu KH, van Boxtel R, Huch M, Rivera KD, Wilson JP, Feigin ME, Ohlund D, Handly-Santana A, Ardito-Abraham CM, Ludwig M, Elyada E, Alagesan B, Biffi G, Yordanov GN, Delcuze B, Creighton B, Wright K, Park Y, Morsink FH, Molenaar IQ, Borel Rinkes IH, Cuppen E, Hao Y, Jin Y, Nijman IJ, Iacobuzio-Donahue C, Leach SD, Pappin DJ, Hammell M, Klimstra DS, Basturk O, Hruban RH, Offerhaus GJ, Vries RG, Clevers H, Tuveson DA. Organoid models of human and mouse ductal pancreatic cancer. ***Cell***. 2015;160(1-2):324-38.

\*Authors contributed equally to work.

1. **Chio, II**, Sasaki M, Ghazarian D, Moreno J, Done S, Ueda T, Inoue S, Chang YL, Chen NJ, Mak TW. TRADD contributes to tumour suppression by regulating ULF-dependent p19Arf ubiquitylation. ***Nat Cell Biol.*** 2012;14(6):625-33.
2. Chen NJ\*, **Chio, II\***, Lin WJ, Duncan G, Chau H, Katz D, Huang HL, Pike KA, Hao Z, Su YW, Yamamoto K, de Pooter RF, Zuniga-Pflucker JC, Wakeham A, Yeh WC, Mak TW. Beyond tumor necrosis factor receptor: TRADD signaling in toll-like receptors. ***Proc Natl Acad Sci*** U S A. 2008;105(34):12429-34.

\*Authors contributed equally to work

*Other Research Articles*

1. Ponz-Sarvise M, Corbo V, Tiriac H, Engle D, Freze K, Oni T, Hwang C, Ohlund D, **Chio II**, Baker L, Filippini D, Wright K, Barpiro T, Huang P, Smith P, Yu K, Jodrell D, Park Y and Tuveson D. Identification of resistance pathways specific to malignancy using organoid models of pancreatic cancer. ***Clinical Cancer research.*** 2019
2. Froeling F, **Chio II**, Li J Li A,  Rogoff H, Tuveson D,  Watson J. Bioactivation of napabucasin triggers reactive oxygen species–mediated killing of cancer cells. ***Clinical Cancer Research***. 2019; 25(23);7162-7174
3. LibertiMV, Dai Z, Wardell S, Baccile J, LiuXJ, GaoX, Baldi R, Mehrmohamadi M, Johnson MO,MadhukarNS, Shestov AA, **Chio II**, TuvesonD, ElementoO, RathmellJC, SchroederFC, McDonnell D and Locasale J.Selective targeting of the Warburge ffect and precision medicine from metabolic control analysis. ***Cell Metabolism***. 2017. Cell metabolism. 2017; 26(4):648-659
4. Ohlund D, Handly-Santana A, Biffi G, Elyada E, Aameida A, Ponz-Sarvise M, Corbo V, Oni T, Hearn S, Lee EJ, **Chio II**, Hwang CI, Tiriac H, Baker L, Engle D, Egeblad M, Fearon D, Crawford J, Clevers H, Park Y, Tuveson D. Distinct populations of inflammatory fibroblasts and myofibroblasts in pancreatic cancer. ***J Exp Med.*** 2017.  2017; 214(3):579-596
5. Yun J, Mullarky E, Lu C, Bosch KN, Kavalier A, Rivera K, Roper J, **Chio, II**, Giannopoulou EG, Rago C, Muley A, Asara JM, Paik J, Elemento O, Chen Z, Pappin DJ, Dow LE, Papadopoulos N, Gross SS, Cantley LC. Vitamin C selectively kills KRAS and BRAF mutant colorectal cancer cells by targeting GAPDH. ***Science***. 2015;350(6266):1391-6.
6. Itsumi M, Inoue S, Elia AJ, Murakami K, Sasaki M, Lind EF, Brenner D, Harris IS, **Chio, II**, Afzal S, Cairns RA, Cescon DW, Elford AR, Ye J, Lang PA, Li WY, Wakeham A, Duncan GS, Haight J, You-Ten A, Snow B, Yamamoto K, Ohashi PS, Mak TW. Idh1 protects murine hepatocytes from endotoxin-induced oxidative stress by regulating the intracellular NADP(+)/NADPH ratio. ***Cell Death Differ.*** 2015;22(11):1837-45.
7. Sasaki M, Knobbe CB, Itsumi M, Elia AJ, Harris IS, **Chio, II**, Cairns RA, McCracken S, Wakeham A, Haight J, Ten AY, Snow B, Ueda T, Inoue S, Yamamoto K, Ko M, Rao A, Yen KE, Su SM, Mak TW. D-2-hydroxyglutarate produced by mutant IDH1 perturbs collagen maturation and basement membrane function. ***Genes Dev.*** 2012;26(18):2038-49.

**Honors and Awards**

1. The Ruth Leff Siegel Award for Excellence in Pancreatic Cancer Research (2020)
2. V Scholar Foundation Award (2018-2020)
3. Pancreatic Cancer Action Network Catalyst Grant (2018-2021)
4. Department of Defense Career Development Award (2019-2021)
5. Paul Marks Scholar Award (Columbia University Medical Center) (2018-2021)
6. Aspen Cancer fellowship
7. Damon Runyon postdoctoral fellowship (2013-2017)
8. Human Frontiers postdoctoral fellowship (2012-2013)