**ANTONIO IAVARONE**

**Overview**

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**Academic Appointments**

* Professor of Neurology, Pathology & Cell Biology

**Research**

The research program pursued by Antonio Iavarone seeks to unravel the biologic and genetic alterations driving subgroups of malignant brain tumors and exploit this information for rational therapeutic stratification. The Iavarone group identified master regulators of cancer initiation and progression in distinct sub-groups of brain tumors. They discovered the first example of oncogenic and tumor addicting gene fusions in glioblastoma (FGFR3-TACC3) and reported that FGFR3-TACC3 fusions trigger tumorigenesis through activation of oxidative phosphorylation. These fusions are among the most frequent chromosomal translocations across all types of human cancer and the FDA approved the targeting of these chromosomal translocations with FGFR inhibitors. Antonio Iavarone chaired the Pan-Glioma ATLAS-TCGA Working Group and the Neurofibromatosis 1 synodos that united international researchers to formulate guidelines for accurate diagnosis and prognosis of glioma patients. By using all the computational and experimental tools at disposal, they combine innovations in both areas to continue making transformative mechanistic discoveries and provide personalized therapeutics to increasing number of patients with deadly tumor types.

**Selected Publications**

1. **Proline Hydroxylation Primes Protein Kinases for Autophosphorylation and Activation**Lee SB, Ko A, Oh YT, Shi P, D'Angelo F, Frangaj B, Koller A, Chen EI, Cardozo T, Iavarone A, Lasorella A  
   Mol Cell. 2020.  
   PMID: 32640193, DOI: 10.1016/j.molcel.2020.06.021
2. **ARS2/MAGL signaling in glioblastoma stem cells promotes self-renewal and M2-like polarization of tumor-associated macrophages**Yin J, Kim SS, Choi E, Oh YT, Lin W, Kim TH, Sa JK, Hong JH, Park SH, Kwon HJ, Jin X, You Y, Kim JH, Kim H, Son J, Lee J, Nam DH, Choi KS, Shi B, Gwak HS, Yoo H, Iavarone A, Kim JH, Park JB  
   Nat Commun. 2020.  
   PMID: 32532977, DOI: 10.1038/s41467-020-16789-2
3. **Clinical, molecular and radiomic profile of gliomas with FGFR3-TACC3 fusions**Di Stefano AL, Picca A, Saragoussi E, Bielle F, Ducray F, Villa C, Eoli M, Paterra R, Bellu L, Mathon B, Capelle L, Bourg V, Gloaguen A, Philippe C, Frouin V, Schmitt Y, Lerond J, Leclerc J, Lasorella A, Iavarone A, Mokhtari K, Savatovsky J, Alentorn A, Sanson M  
   Neuro-oncology. 2020.  
   PMID: 32413119, DOI: 10.1093/neuonc/noaa121
4. **The molecular landscape of glioma in patients with Neurofibromatosis 1**D'Angelo F, Ceccarelli M, Tala , Garofano L, Zhang J, Frattini V, Caruso FP, Lewis G, Alfaro KD, Bauchet L, Berzero G, Cachia D, Cangiano M, Capelle L, de Groot J, DiMeco F, Ducray F, Farah W, Finocchiaro G, Goutagny S, Kamiya-Matsuoka C, Lavarino C, Loiseau H, Lorgis V, Marras CE, McCutcheon I, Nam DH, Ronchi S, Saletti V, Seizeur R, Slopis J, Suñol M, Vandenbos F, Varlet P, Vidaud D, Watts C, Tabar V, Reuss DE, Kim SK, Meyronet D, Mokhtari K, Salvador H, Bhat KP, Eoli M, Sanson M, Lasorella A, Iavarone A  
   Nat Med. 2019.  
   PMID: 30531922, DOI: 10.1038/s41591-018-0263-8
5. **The combination of neoantigen quality and T lymphocyte infiltrates identifies glioblastomas with the longest survival**Zhang J, Caruso FP, Sa JK, Justesen S, Nam DH, Sims P, Ceccarelli M, Lasorella A, Iavarone A  
   Commun Biol. 2019.  
   PMID: 31044160, DOI: 10.1038/s42003-019-0369-7
6. **Pharmacogenomic landscape of patient-derived tumor cells informs precision oncology therapy**Lee JK, Liu Z, Sa JK, Shin S, Wang J, Bordyuh M, Cho HJ, Elliott O, Chu T, Choi SW, Rosenbloom DIS, Lee IH, Shin YJ, Kang HJ, Kim D, Kim SY, Sim MH, Kim J, Lee T, Seo YJ, Shin H, Lee M, Kim SH, Kwon YJ, Oh JW, Song M, Kim M, Kong DS, Choi JW, Seol HJ, Lee JI, Kim ST, Park JO, Kim KM, Song SY, Lee JW, Kim HC, Lee JE, Choi MG, Seo SW, Shim YM, Zo JI, Jeong BC, Yoon Y, Ryu GH, Kim NKD, Bae JS, Park WY, Lee J, Verhaak RGW, Iavarone A, Lee J, Rabadan R, Nam DH  
   Nat Genet. 2018.  
   PMID: 30262818, DOI: 10.1038/s41588-018-0209-6
7. **Diffuse gliomas with FGFR3-TACC3 fusion have characteristic histopathological and molecular features**Bielle F, Di Stefano AL, Meyronet D, Picca A, Villa C, Bernier M, Schmitt Y, Giry M, Rousseau A, Figarella-Branger D, Maurage CA, Uro-Coste E, Lasorella A, Iavarone A, Sanson M, Mokhtari K  
   Brain Pathol. 2018.  
   PMID: 28976058, DOI: 10.1111/bpa.12563
8. **A metabolic function of FGFR3-TACC3 gene fusions in cancer**Frattini V, Pagnotta SM, Tala , Fan JJ, Russo MV, Lee SB, Garofano L, Zhang J, Shi P, Lewis G, Sanson H, Frederick V, Castano AM, Cerulo L, Rolland DCM, Mall R, Mokhtari K, Elenitoba-Johnson KSJ, Sanson M, Huang X, Ceccarelli M, Lasorella A, Iavarone A  
   Nature. 2018.  
   PMID: 29323298, DOI: 10.1038/nature25171
9. **Clonal evolution of glioblastoma under therapy**Wang J, Cazzato E, Ladewig E, Frattini V, Rosenbloom DI, Zairis S, Abate F, Liu Z, Elliott O, Shin YJ, Lee JK, Lee IH, Park WY, Eoli M, Blumberg AJ, Lasorella A, Nam DH, Finocchiaro G, Iavarone A, Rabadan R  
   Nat Genet. 2016.  
   PMID: 27270107, DOI: 10.1038/ng.3590
10. **Molecular Profiling Reveals Biologically Discrete Subsets and Pathways of Progression in Diffuse Glioma**Ceccarelli M, Barthel FP, Malta TM, Sabedot TS, Salama SR, Murray BA, Morozova O, Newton Y, Radenbaugh A, Pagnotta SM, Anjum S, Wang J, Manyam G, Zoppoli P, Ling S, Rao AA, Grifford M, Cherniack AD, Zhang H, Poisson L, Carlotti CG, Tirapelli DP, Rao A, Mikkelsen T, Lau CC, Yung WK, Rabadan R, Huse J, Brat DJ, Lehman NL, Barnholtz-Sloan JS, Zheng S, Hess K, Rao G, Meyerson M, Beroukhim R, Cooper L, Akbani R, Wrensch M, Haussler D, Aldape KD, Laird PW, Gutmann DH, , Noushmehr H, Iavarone A, Verhaak RG  
    Cell. 2016.  
    PMID: 26824661, DOI: 10.1016/j.cell.2015.12.028
11. **Detection, Characterization, and Inhibition of FGFR-TACC Fusions in IDH Wild-type Glioma**Di Stefano AL, Fucci A, Frattini V, Labussiere M, Mokhtari K, Zoppoli P, Marie Y, Bruno A, Boisselier B, Giry M, Savatovsky J, Touat M, Belaid H, Kamoun A, Idbaih A, Houillier C, Luo FR, Soria JC, Tabernero J, Eoli M, Paterra R, Yip S, Petrecca K, Chan JA, Finocchiaro G, Lasorella A, Sanson M, Iavarone A  
    Clin Cancer Res. 2015.  
    PMID: 25609060, DOI: 10.1158/1078-0432.CCR-14-2199
12. **The integrated landscape of driver genomic alterations in glioblastoma**Frattini V, Trifonov V, Chan JM, Castano A, Lia M, Abate F, Keir ST, Ji AX, Zoppoli P, Niola F, Danussi C, Dolgalev I, Porrati P, Pellegatta S, Heguy A, Gupta G, Pisapia DJ, Canoll P, Bruce JN, McLendon RE, Yan H, Aldape K, Finocchiaro G, Mikkelsen T, PrivÃ© GG, Bigner DD, Lasorella A, Rabadan R, Iavarone A  
    Nat Genet. 2013.  
    PMID: 23917401, DOI: 10.1038/ng.2734
13. **Transforming fusions of FGFR and TACC genes in human glioblastoma**Singh D, Chan JM, Zoppoli P, Niola F, Sullivan R, Castano A, Liu EM, Reichel J, Porrati P, Pellegatta S, Qiu K, Gao Z, Ceccarelli M, Riccardi R, Brat DJ, Guha A, Aldape K, Golfinos JG, Zagzag D, Mikkelsen T, Finocchiaro G, Lasorella A, Rabadan R, Iavarone A  
    Science. 2012.  
    PMID: 22837387, DOI: 10.1126/science.1220834
14. **The transcriptional network for mesenchymal transformation of brain tumours**Carro MS, Lim WK, Alvarez MJ, Bollo RJ, Zhao X, Snyder EY, Sulman EP, Anne SL, Doetsch F, Colman H, Lasorella A, Aldape K, Califano A, Iavarone A  
    Nature. 2010.  
    PMID: 20032975, DOI: 10.1038/nature08712