Building and Characterizing a Collaboration Network of the US National Cancer Institute's Extramural Workforce

NIH NATIONAL CANCER INSTITUTE

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Intro

- The National Cancer Institute (NCI) supports a substantial extramural workforce of investigators through grants[1]
- The White House Cancer Moonshot Initiative[2] and the National Cancer Plan[3] bring the goal of fostering greater collaboration to the forefront of cancer research
- We seek to assess collaboration among the NCI-supported cancer research community

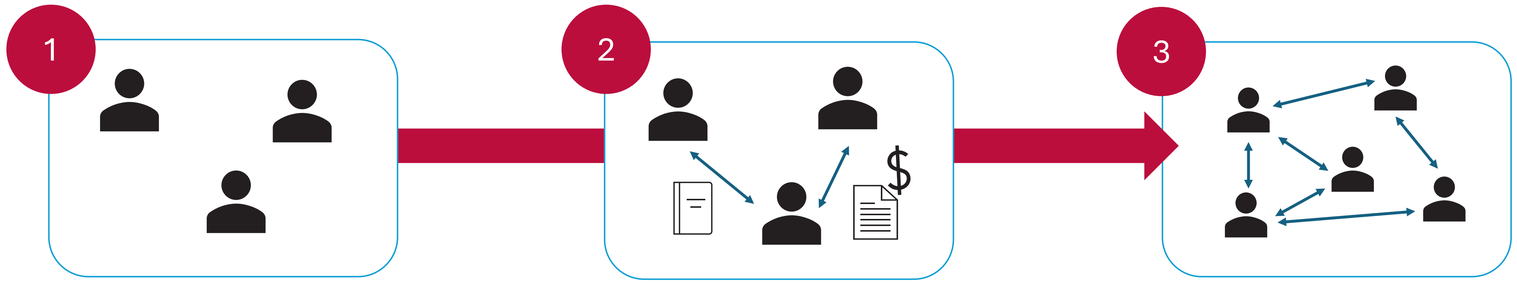
Network Overview

- Network nodes: 10,330 PIs
- Network edges: 1,141,822 unique collaborative events forming 262,907 unique pairwise collaborations between PIs
- 236,762 publications (228,546 journal items and 8,216 conference proceedings) and 6,200 NIH projects form the network edges
- PIs were matched to projects and publications using Dimensions for NIH

Discussion

- We plan to use this network to answer questions and analyze collaborations among NCI funded investigators
- What are we missing to understand collaborations?

Building a *measurable* view of collaboration



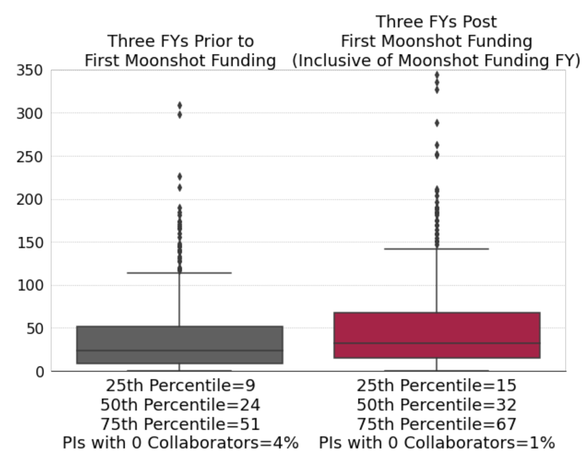
NCI PIs were **added** to the network based on qualifying NCI **research funding** (Research Project Grants such as the R01, R37, U01 or Research Center Grants such as the P50 or U54) in FY 2017-2022

NCI PIs were **connected** to other NCI PIs in the network based on
1. **co-authorship** of items in peer-reviewed journals or proceedings or
2. **co-funding** on an awarded NIH project in FY 2012-2023

Together, the NCI PIs and the publications and projects connecting pairs of PIs form the nodes and edges of the **NCI Extramural Investigator Network**

EXAMPLE APPLICATION

- We used this network in our assessment of the Cancer Moonshot's progress towards fostering greater collaboration by sub-setting the network to the 592 extramural PIs that received Moonshot Funding in FY 2017 – 2023
- The entire network was then used to contextualize Moonshot PI collaborations



Number of Unique Pairwise Collaborative Events between PIs in 2012 - 2023	Collaborations in the NCI Extramural Investigator Network (n=195,324)	Collaborations in the network of Moonshot supported PIs (n=5,085)
One	47%	50%
Two	17%	16%
Three or More	37%	33%

Table 1 (above): Percentage of collaborations with one, two, or three or more collaborative events (publications or projects) by 2023. Percentages are rounded and therefore a column may not sum to 100%.

Figure 1 (left): Node degree for the 504 PIs that had a minimum of three years to collaborate post Moonshot funding. We counted all collaborators across the NCI Extramural Investigator Network. The number of unique collaborators post-Moonshot award (median=32) window was higher than in the pre-Moonshot award (median=24) window ($p < 10\text{-}3$, $rs = 0.83$, Wilcoxon matched pairs test).

REFERENCES

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