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Five Questions with Nic Encina: Working Upstream or Downstream

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In our Five-Question series, we highlight the staff and faculty behind the compelling work at Ariadne Labs.

Upstream or downstream? That has long been a career question for Nic Encina, MS, MS, MBA, now Director of Strategy of the [Precision Population Health](https://www.ariadnelabs.org/precision-population-health/) < <https://www.ariadnelabs.org/precision-population-health/>> initiative at Ariadne Labs.

In the medical and health world “upstream” is often used to refer to breakthrough innovations, such drugs, devices, or treatments, while “downstream” refers to the follow-through of implementing those discoveries in real-life settings. Encina first began to ponder working upstream or downstream after he received his BS degrees in biology and psychology from the University of Rochester, and working as a medical technician for the family of Lorenzo Odone, a boy suffering from [a rare disease called adrenoleukodystrophy](https://en.wikipedia.org/wiki/Adrenoleukodystrophy) < <https://en.wikipedia.org/wiki/Adrenoleukodystrophy>> (ALD).

The Odone family’s search for a cure for ALD became the basis of the 1992 movie “Lorenzo’s Oil,” which focused on the family’s determination not to wait years for ALD therapy – at the expense of their child’s life – but to research the possibilities themselves. This experience helped to influence Encina’s return to research; he received an MS in Stem Cell Biology, an MS in Computer Science, and an MBA in health care from Yale School of Management.

“Sometimes we’re not okay with waiting 10 years, 20 years for innovations to diffuse across health care,” he said. “When there’s an urgent need to save lives, it’s incredible what determined people are capable of.”

Encina spent many years working in the biotech industry and also worked on the Human Genome Project. In 2017, he joined Ariadne Labs as Chief Science and Technology Officer. In 2021 became Director of Strategy of the Precision Population Health initiative, a collaboration between Ariadne Labs and [Genomes2People](https://www.genomes2people.org/) < <https://www.genomes2people.org/>> which brings together experts in clinical genomics and implementation to support adoption of precision medicine in primary care.



< <https://www.ariadnelabs.org/wp-content/uploads/2023/04/Screen-Shot-2023-04-21-at-4.00.08-PM.png>>

Nic Encina, Director of Strategy for Precision Population Health

Q: What first attracted you to Ariadne Labs?

A: What brought me here – given that it was such a departure from where I was before in biotech and early drug discovery – was really the opportunity of going way downstream into clinical care. In my previous world, we would talk a lot about saving patients' lives and making an impact. Given that my career beforehand spanned from Human Genome Project to drug discovery and even clinical trials, I found it really compelling to be able to complement that with downstream clinical delivery of care, to be able to see that full spectrum of early discovery all the way down to treating humans now.

Q: How did you get involved with Precision Population Health?

A: I would not have gone into Precision Population Health had I not been at Ariadne. In all my early discovery work, I was really much more focused on discovering the markers or doing the sequencing or discovering the drug that can target some modality to affect some disease. I wasn't even thinking in terms of: How will doctors use this, or how will patients understand it, or what conversations will they be having? Much has been done in specialty care, from oncology to rare diseases. Those fields have been completely revolutionized by precision medicine. We have built a large arsenal – panels of hundreds of genes that are highly relevant at population health levels, that are highly penetrant and actionable – that we should be screening people for in primary care for preventative care. And yet we're not. There's a know-do gap with massive potential that we must cross, as a society.

And so I came up with the idea for what became Precision Population Health. It turns out that right in our own backyard, doing some of the seminal work in this space, was [Robert C. Green](https://www.ariadnelabs.org/profile/robert-c-green/), MD, MPH, Professor of Medicine (Genetics) at Harvard Medical School and a physician-scientist who directs the Genomes2People Research Program at Brigham and Women's Hospital, the Broad Institute, and Harvard Medical School. We met and we said: We *must* do this! I submitted for a [Spark Grant](https://www.ariadnelabs.org/spark-grants/) to do a literature review to see where the field stood. We found that, sure enough, people are struggling with a lot of raw implementation challenges – the kinds of challenges that we work on at Ariadne, and solve in different contexts across our programs.

Q: What are some of those challenges?

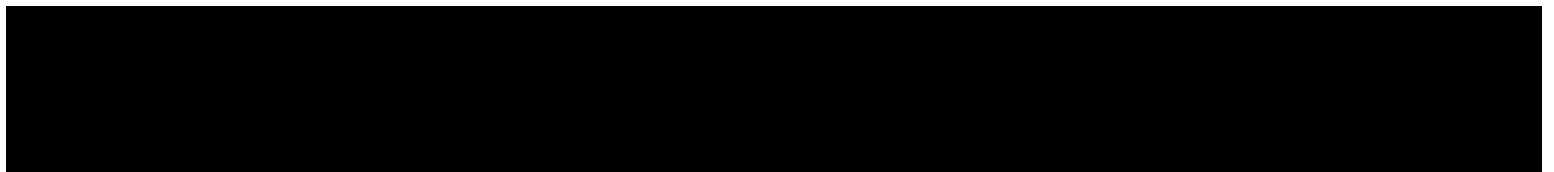
A: Let's say you have primary care physicians who have never taken a genetic course in their life. How do you get them ready to identify which patients should be screened, have the test done, get the results back, interpret results, and then have a conversation with patients on a scary outcome that could result from a genetic marker, which immediately puts you into a serious illness care conversation. That scenario alone involves implementation challenges from training clinicians, coordinating multidisciplinary teams, identifying and educating patients, to facilitating concordant care conversations – all things that we have faced in other Ariadne programs!

Q: Where do you see Precision Population Health at Ariadne Labs going ten years from now?

A: In October 2022, we hosted the inaugural International Conference on Newborn Sequencing (ICoNS). It was a highly successful conference, and we're already working on ICoNS'23, which will be co-hosted with Genomics England in London. The conference is ushering in the era of newborn sequencing. All of the world leaders in this field are presenting, and they're all a part of a global consortium that we also founded. If you think about preventative care, this is where you're going to reap the most rewards. This is the future paradigm of health care. I don't see a version of health care in the future that doesn't somehow interface with precision medicine, and Ariadne is now at the forefront of this implementation frontier that will transform how we think about medicine and prevention

Q: How has working downstream played out for you?

A: The upstream, discovery work was intellectually fascinating and thrilling in that we were truly elevating our understanding of science and how the human body works. But downstream are all sorts of interesting challenges in how society accepts those discoveries and uses them to affect lives at scale. The issues are different, but no less rewarding. In fact, far more so because we can drive actual impact. Raw discoveries are useless unless they become practical, accessible, and applicable. I couldn't have imagined that my career would have taken me across the spectrum of health, from discovery to delivery, and even to population levels, but now that I look back I really couldn't imagine it any other way.



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