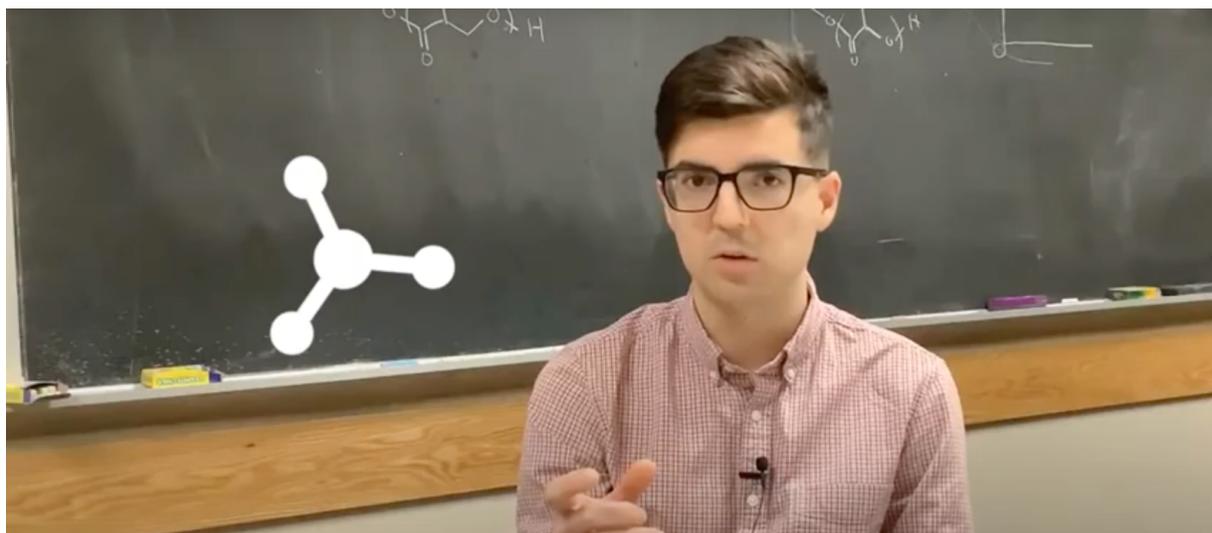


Meet a Scientist: Teli Zografos, Polymer Chemist, University of Minnesota



Polymer chemist Teli Zografos uses his love for exploration to develop and test plastics that are made from plants and are ultimately better for the environment.

This is a transcript of the “Meet a Scientist: Teli Zografos, Polymer Chemist” video, part of the 4-H STEM curriculum: Sustainable Polymers-Plastics of the Future for a Green,Clean World (Find the video and curriculum at: www.4hpolymers.org).

My name is Teli Zografos. I’m a graduate student at the University of Minnesota - Twin Cities, where I do research for the Center for Sustainable Polymers.

Why do you like being a scientist?

I really enjoy being a scientist because, I mean, it's all about asking questions, and honestly it's that exploration of the unknown -- exploring things that people have never explored before -- that's what really excites me in science.

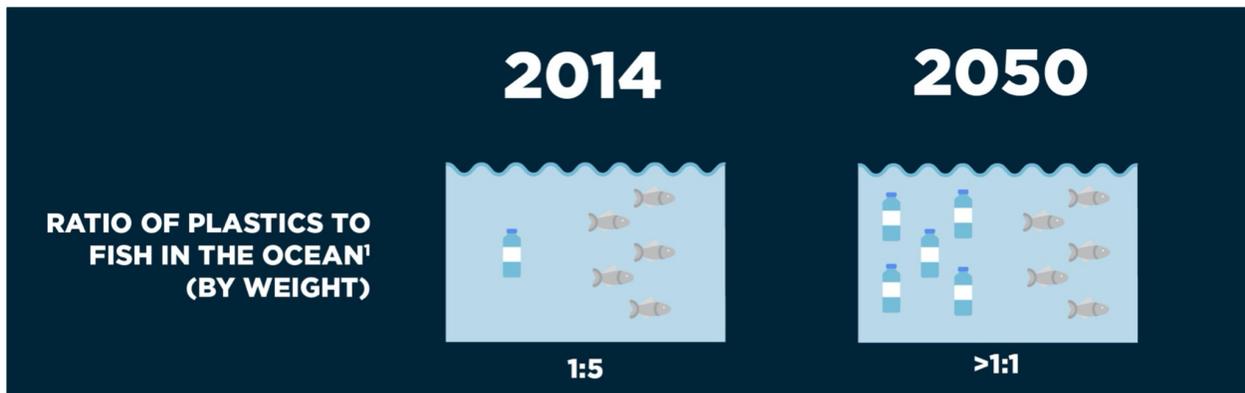
What skills do scientists need?

One of the biggest skills that a scientist should have is working well with others. A lot of the challenges we face are really difficult. These are questions that have never been explored, so it's perfectly natural that you won't be able to answer that question by yourself. So what we have to do is work together in groups to really tackle these questions that have just confounded the greatest minds for years. I think that that's one of the really important things to take away.

Challenges with Traditional Plastics

So one of the main challenges with plastics that we have today is how we use them. There's been a couple of scientific studies that show that about 80% of all the plastics ever made have just ended up in landfills or into the environment.

Some studies estimate that by 2050 there's going to be as much mass of plastics in the ocean as there are fish. So it's really important that we dedicate research towards developing plastics that are recyclable and more sustainable.



Source: The New Plastics Economy-Rethinking the future of plastics
http://www3.weforum.org/docs/WEF_The_New_Plastics_Economy.pdf

What is your research?

A polymer essentially is a long chain of repeating molecules. So, in other words, if you were to take one particular molecule, bind it to another molecule, and repeat that process over and over and over again until you have this large repetition of the same molecule, you would essentially have a polymer. Depending on how these different molecules, or long chains of molecules, are now connected, you can drastically affect the material properties. So, depending on their connectivity, you can effectively change how strong the material is, how ductile it is, how stretchy, and how stiff it is -- things like that.

So my research, again, is taking this connectivity of the polymer chains, changing how polymers are connected within a given molecule, and using our understanding of how changing that connectivity influences properties to develop strong polymers that are tough and also derive from plants.

Benefits of Plastics Made from Plants

One of the benefits from plastics being made from plants is that they can be biodegradable. So if you were to throw it away and it ends up in a landfill, it's possible that microorganisms can then take that polymer and break it down into smaller molecules that are not as detrimental to the environment. If you were to take, for example, a petroleum-based polymer that is made from oil, such as polyethylene -- which is found in milk jugs -- that polymer, if you were to throw it into the



environment, won't degrade for hundreds of years. So one of the benefits of sustainably-sourced polymers is that they're biodegradable.