Hello.

I am Namuunzul Otgontseren from the University of Illinois at Urbana Champaign in the ChanLab which led by Dr. Jeff Chan where I am mentored by Nick Pino.

I'll be talking about "Accessing In Vivo and Multiplexed Imaging through the Development of a Multicolor Panel of Activatable HNO Probes"

So nitroxyl or HNO is unique, because it has been shown to be possible treatments to the prevention of ischemia-reperfusion injury, myocardial infarction, and alcoholism.

The problem is, however, that it has a very very high reactivity rate with itself, oxygen, metalloproteins and thiols so it's pretty difficult to study in biological systems.

Our lab has previously developed this probe called NitroxylFluor which is a green fluorescent probe with live-cell fluorescence imaging capabilities of HNO so we can learn more about HNO.

The utilizes this **α**-thioisobutyric ester as the trigger where this thiol nucleophilically attacks HNO to create this N-hydroxysulfenamide intermediate where this then cyclizes off in order to reveal this highly fluorescent compound.

As I mentioned, NitroxylFluor is a green fluorescent probe, which makes it difficult to perform multiplexed imaging since most commercially available probes and fluorescent proteins are also green.

So this brings us to our current project which is to create these red-shifted derivatives of NitroxylFluor.

Doing so hopefully will optimize NitroxylFluor's localization, spectral properties, and photophysical properties.

The three congeners shown here have the main differences of where this one has a quaternary carbon, a dimethylsilicon, and a sulfonyl group..

As you can see, all three of these will use the same **α**-thioisobutyric ester as the trigger.

With these three congeners, we are hoping to achieve multiplexed imaging with other analytes or other analyte probes so that we can see the relationship between HNO and other analytes and targets.

One that we are keen on learning more about in the relationship between HNO and hydrogen peroxide.

Other benefits to having these derivatives with longer wavelengths are reducing light scattering and deeper tissue penetration for *in vivo* imaging.

So far, our lab has already created this magenta NitroxylFluor.

I've synthesized this yellow one with the synthesis shown here.

It didn't originally have this chlorination step, but the probe without these chlorines didn't turn on when we looked at it with the fluorometer.

The chlorinated probe, however, had a much better success which is shown on this graph provided by Nick where it shows the normalized fluorescence turn on.

So this is nowhere near the 16-fold turn-on of the original NitroxylFluor so we are working on trying to understand why this may be.

The next step after that is to create the sulfonyl derivative.

After all these probes are synthesized, we are hoping to add chemical organelle directing groups so we can learn more about HNO at the subcellular level and then hopefully HNO has more of a chance being used as a treatment with more information that we obtain from it.

And with that thank you so much for hearing me today and thank you for your time.

Have a good day.

Bye.