Title: When Artists Experiment With Science

Host Intro: Now we bring you a story about how experiments can uncover hidden truths. In science, experiments lead to medical breakthroughs and newer, faster technologies. In the arts, experiments push the boundaries of creativity. Meisa Salaita examines what happens when experimentation blurs the boundary between science and art.

Meisa intro: This is Small Matters – the audio series where we sweat the little things. I'm Meisa Salaita.

[Sound of Adam Fristoe directing]

Meisa: Adam Fristoe is coaching a group of students about how to put emotion into a theatrical scene.

[Sound of Adam Fristoe directing]

Meisa: Fristoe not only teaches acting, but he likes to put experimentation into action.

Fristoe: I make new theatrical experiences.

Meisa: Fristoe is the co-artistic director of Out of Hand Theater in Atlanta, Georgia. And his theater company does really unexpected things. They've staged plays inside of cars, where audience members hop in the backseat to experience quick morsels of theater. They've hosted a play where the actor has never even seen the script before performing it. And one of their more recent works turns the tables on the audience and invites them to play the characters.

Fristoe: And they go through an experience that, in some ways – artistically at least, mimics the self-assembly of molecules.

Meisa: That's right. Molecules. This experience – called "Group Intelligence" isn't so much a play as it is a kind of flash mob where participants walk around acting out tasks and drawing parallels between themselves and groups of molecules. Fristoe's inspiration to explore this molecular world: a group of scientists:

Fristoe: I love hanging out with scientists. I think it's a great match.

Meisa: Fristoe doesn't just hang out with scientists. He joined forces with them to develop this theater piece.

Fristoe: I think we work in a way that's really quite similar. And in my experience, we think in a similar way. We come up with an idea of something we want to discover or try to figure out. We start testing it out. We fail a lot. A whole lot. And then we keep going and we keep working on it.

Meisa: Fristoe collaborated with a few scientists on this project…. including David Lynn, the chair of the chemistry department at Emory University.

Lynn: I work on questions of chemical evolution and emergent properties of organized matter.

Meisa: Lynn studies how molecules organize themselves in ways that give rise to interesting properties – ones, say, that are important for life…. like self-replication and compartmentalization. And not only does he investigate how molecules get organized, but how they evolve to better organize. When Adam Fristoe asked him if he wanted to collaborate, Lynn was intrigued.

Lynn: The chemistry is invisible. So when I talk about molecules, it's a little difficult to see, difficult to comprehend, difficult to explain. But in a public display, in a piece of art, you can see it and it affects you in the context of stories that you bring to that piece of art, so it means something.

Meisa: The public display of art that Lynn and Fristoe dreamed up is a massive group experience. In an Atlanta park, a few hundred people downloaded mp3 tracks, and then everyone hit play at the same time. What they heard guided the participants through the activity.

GI Clip: You are alone. You are matter, Molecules.

Meisa: The soundtracks took the group on an epic journey. Without knowing one another, the participants found themselves collaborating to carry out tasks. Like forming a figure eight. And the tasks kept getting harder.

GI Clip: When you hear the sound, you are going to start singing a song. You'll have 1 minute to have everyone singing the same song. Keep moving and keep singing until you are all singing the same song in unison. Ready? Go.

GI Clip: [Sound of singing songs]

Meisa: What seems like a silly exercise where participants went from all singing different songs to something simple like Happy Birthday in unison was actually a carefully designed artistic analogy to David Lynn's research: For molecules to survive, there must be a diverse group of them cooperating with one another and evolving over time. To sing a song in unison or to make a figure eight, to accomplish the various tasks posed by the narrator and set the stage for evolution to occur, people must cooperate.

By turning human participants into molecules in this theatrical experiment, Fristoe's tackling one of the problems that can plague chemists when they talk about their science.

Fristoe: We've been getting people to think about what science is in a different way. To think about science through story because as humans story is very compelling for us. We want to learn things through story.

Meisa: Fristoe has brought this theatrical experience to city parks and college campuses across the country. This collaboration between artist and scientist in many ways mirrors the concepts the two are trying to illustrate in Group Intelligence. Cooperation arising from a diverse pool really can bring about something special.

GI Clip: As all life is made of molecules behaving cooperatively, so you have succeeded in cooperating with your group, creating group intelligence.

Meisa: To hear how another Atlanta-based artist has taken on the world of science, visit smallmatters.org for a special audio extra.

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Our series, Small Matters, is produced by the Center for Chemical Evolution, and sponsored by the National Science Foundation, with additional support from NASA. I'm Meisa Salaita.