DR. ALAN FIELDS: My name is Dr. Alan Fields, and I'm the Monica Flynn Jacoby Professor of Cancer Research at the Mayo Clinic in Florida. I'm here to talk to you today about a study that is being published in cancer cell. This study is entitled Two Oncogenes Protein Kinase C iota and SOX2 coordinate to drive lung squamous cell carcinoma. The purpose of this study was to identify the importance of a recurrent genetic alteration that is found commonly in lung squamous cell carcinoma called 3q26 amplification. And this amplification drives the expression of an oncogene that we discovered some years ago called Protein Kinase C, or PRKCI.

What this study focused on was trying to understand how this genetic alteration and the amplification of Protein Kinase C iota drives lung squamous cell carcinoma. The study demonstrated that, in fact, there are two genes, two oncogenes that are coordinately amplified and overexpressed as a consequence of this 3q26 amplification. And that furthermore, these two oncogene not only are genetically altered, but are also biochemically and functionally linked to each other in squamous cell carcinoma cells that harbor this 3q26 amplification. So the study demonstrated that in fact, these two genes coordinate with each other to activate a third pathway called the Hedgehog pathway, which is involved in maintaining a stem-like phenotype within these lung squamous cell carcinoma tumors.

Cancer stem cells are thought to be the cells within a tumor that are responsible for both the initiation of the tumor, the maintenance of the tumor itself, as well as progression and things like metastasis and, more importantly, relapse after therapy. So gaining an understanding of how tumor stem cells are maintained will help us to that target therapeutics towards these cancer stem cells.

The study that I just described to you demonstrates that, in fact, PKC iota is an important driver of this stem cell phenotype in squamous cell carcinoma. So what does that mean? Well, in the future what we'd like to ask since this 3q26 amplification is not only commonly found in squamous cell carcinoma of the lung, but many other solid tumors, such as head and neck cancers, ovarian cancers, breast cancers, we want to know whether this same 3q26 amplification is driving the same pathway in these major tumors as well.

Secondly, we have developed therapeutic agents that target PKC iota, and there are also therapeutic agents that target the Hedgehog signaling pathway, which PKC iota activates, we found activates in these stem cells. So this leads to a possible therapeutic opportunity in which we can combine therapy to PKC iota and to this Hedgehog signaling pathway, which we hope will provide more effective responses in squamous cell carcinoma patients.