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# Award-winning science: Cancer-promoting metabolic pathways as targets of new therapies

**Christiane Opitz, scientist at the German Cancer Research Center, is being awarded this year's Ita Askonas Prize of the European Federation of Immunological Societies. Opitz has discovered how tumor cells use certain metabolites to protect themselves against the immune system. Her research findings may provide important clues for the development of new therapeutic concepts.**

What makes certain brain tumors particularly aggressive? That was the initial question that put Christiane Opitz on the trail of cancer-promoting metabolites. Several years ago, the scientist from the German Cancer Research Center had already discovered that certain degradation products of the essential amino acid tryptophan activate the so-called aryl hydrocarbon receptor (AHR) in brain tumor cells. The activated receptor causes a number of genes to be transcribed in cancer cells that promote the spread of the tumor while protecting it from attack by the immune system.

Exactly how it happens that the cancer-promoting degradation products are formed was not fully understood at first. Therefore, Christiane Opitz and her colleagues recently systematically investigated which tryptophan-degrading enzymes are associated with activation of the AH receptor in 32 different types of cancer.

The scientists focused on the enzyme IL4I1: No other enzyme of the tryptophan metabolism was so strongly linked to an activation of the AH receptor as IL4I1. The metabolites formed by IL4I1 bind to the AH receptor and activate it, promoting cancer cell motility and thus tumor spread. In addition, IL4I1-positive tumors accumulate particularly large numbers of inhibitory immune cells, which suppress effective tumor control. The researchers also found evidence that IL4I1 is responsible for the dreaded resistance of tumors to immunotherapies with the so-called checkpoint inhibitors.

The newly discovered metabolic pathway represents a potential target for cancer therapy. The goal is to inhibit tumor growth and strengthen the immune system. Opitz and colleagues are now looking for substances that specifically block this metabolic pathway and are suitable as potential tumor drugs. The European Federation of Immunological Societies honors these results, which span the spectrum from basic tumor biology research to the testing of a potential clinical application, with the Ita Askonas Prize 2021.

The prize is awarded by the European Federation of Immunological Societies in conjunction with the European Journal of Immunology to recognize outstanding young immunologists. The prize, now endowed with 20,000 euros, was first awarded in 2009, and Chistiane Opitz is the 5th recipient. The award was officially presented on September 2 at the 6th European Congress of Immunology.

Christiane Opitz completed a master's degree in molecular cell biology in parallel to her medical studies in Heidelberg, the USA, Sweden and Switzerland. After receiving her PhD, she did postdoctoral research at the University of Indianapolis, USA, at the University of Tübingen and finally at the DKFZ in Heidelberg. In 2013, Chistiane Opitz established the Junior Research Group Brain Tumor Metabolism at DKFZ, which she still leads today. Opitz has already been awarded numerous high-ranking scientific prices: the award of the Berlin-Brandenburg Academy of Sciences, the Bayer Early Excellence Award or the Hella Bühler Award of the University of Heidelberg.

**Press release**

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**Further information**

- German Cancer Research Center (DKFZ), Heidelberg