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Communication Recherche

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## PRESS RELEASE

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**Publication in *Cell Stem Cell*: Researchers at the Université libre de Bruxelles, ULB uncover a new mechanism involved in tumour initiation, growth and progression in skin squamous cell carcinoma.**

Squamous cell carcinoma (SCC) represents the second most frequent skin cancer with more than half million new patients affected every year in the world. Cancer stem cells (CSCs) are a population of cancer cells that have been described in many different cancers, including skin SCCs and that feed tumor growth, could be resistant to therapy thus being responsible for tumor relapse after therapy. However, still very little is known about the mechanisms that regulate CSCs functions.

In a new study published in *Cell Stem Cell*, researchers led by Pr. **Cédric Blanpain**, MD/PhD, professor and WELBIO investigator at the IRIBHM, Université libre de Bruxelles, Belgium, **report a crucial role for the transcription factor Twist1 in regulating skin tumour initiation, cancer stem cell function and tumor progression.**

**Benjamin Beck** and colleagues used state of the art genetic mouse models to dissect, the functional role and molecular mechanisms by which Twist1 controls tumor initiation, cancer stem cell function and tumor progression. In collaboration with Dr Sandrine Rorive and Pr Isabelle Salmon from the department of Pathology at the Erasme Hospital, ULB and the group of Jean-Christophe Marine (VIB, KUL Leuven), they demonstrated that while Twist1 is not expressed in the normal skin, Twist1 deletion prevents skin cancer formation demonstrating the essential role of Twist1 during tumorigenesis. “It was really surprising to observe the essential role of Twist1 at the earliest step of tumor formation, as this gene was thought to stimulate tumor progression and metastasis” comments **Benjamin Beck**, the first author of this study.

Using genetic deletion of different copies of Twist1, the authors demonstrate that different levels of Twist1 are necessary for tumor initiation and progression. Low level of Twist1 is required for the initiation of benign tumors, while higher level of Twist1 is

necessary for tumor progression. They also demonstrate that Twist1 is essential for tumor maintenance and the regulation of cancer stem cell function. The researchers also uncovered that the different functions of Twist1 are regulated by different molecular mechanisms, and identified a p53 independent role of Twist1 in regulating cancer stem cell functions.

In conclusion, this work shows that Twist1, a well-known regulator of tumor progression, is necessary for tumor initiation, regulation of cancer stem cell function and malignant progression. “It was really interesting to see that different levels of Twist1 are required to carry out these different tumor functions and that these different Twist1 functions are regulated by different molecular pathways. Given the diversity of cancers expressing Twist1, the identification of the different mechanisms controlled by Twist1 are likely to be relevant for other cancers” comments **Cédric Blanpain**, the last and corresponding author of this study.

This work was supported by the FNRS, Fondation Contre le Cancer, Fondation ULB, ERC the Fonds Gaston Ithier, the Fond Yvonne Boël, the foundation Bettencourt Schueller, and the foundation Baillet-Latour. Cédric Blanpain is an investigator of WELBIO.

Journalists should seek to credit ***Cell Stem Cell*** as the source of the covered story.

Benjamin Beck, Gaëlle Lapouge, Sandrine Rorive, Benjamin Drogat, Kylie Desaedelaere, Stephanie Delafaille, Christine Dubois, Isabelle Salmon, Karen Willekens, Jean-Christophe Marine, and Cédric Blanpain. Different Levels of Twist1 Regulate Skin Tumor Initiation, Stemness and Progression. *Cell Stem Cell* 2014, <http://dx.doi.org/10.1016/j.stem.2014.12.002>

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