Heterogeneity of Cancer Stem Cells: Rationale for Targeting the Stem Cell Niche

Maximilian Bösch, Sieghart Sopper, Alain G Zeimet, Daniel Reimer, Guenther Gastl, Burkhard Ludewig & Dominik Wolf

Malignancy is fuelled by distinct subsets of stem-like cells which persist under treatment and provoke drug-resistant recurrence. Eradication of these cancer stem cells has therefore become a prime objective for the development and design of novel classes of anti-cancer therapeutics with improved clinical efficacy. Here, we portray potentially clinically-relevant hallmarks of cancer stem cells and focus on their recently appreciated properties of cell variability and plasticity, both of which make them elusive targets for cancer therapies. We reason that this 'disguise in heterogeneity' has fundamental implications for clinical management and elaborate on rational strategies to combat this diversity and target a broad range of tumorigenic cells. We propose exploitation of cancer stem cell niche dependence as a promising approach to interfere with various, rather than few, cancer stem cell subsets and suggest cancer-associated fibroblasts as a prime microenvironmental target for tumor stemness-depleting intervention.

type: journal paper/review (English)
date of publishing: 2016
journal title: Biochim Biophys Acta
ISSN print: 0006-3002