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Acute lymphoblastic leukemia (ALL) and proteomics: Looking for protein-biomarkers of pediatric relapses

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It may be a cliché, but it is nonetheless true: if we all have achieved more, it is because we stand on the shoulders of those early giants. Because of them, the cure of childhood ALL may be the greatest cancer story ever told (By Joseph V. Simone, MD: December 2008 as part of the special ASH anniversary brochure, 50 Years in Hematology: Research that revolutionized patient care.

Since 1950, important break throughs in the treatment of pediatric ALL have been achieved. Now a days, more than 80% of children suffering ALL can be cured. However, around 30% of the patients will still relapse, being this group of patients the ones focused by the investigators.

We aim to review proteomics research on pediatric ALL due to (a) this tool is providing several important advances to combat cancer cells, (b) when applying phosphoproteomics for leukemia investigation, novel and real protein-biomarkers of resistance or sensitivity to drugs which target the signalling-networks will appear.

We detail important tips for a proper phospho-quantitative design and strategy for pediatric ALL (relapse vs. remission) research studies when using human body fluids from cerebrospinal and bone-marrow. A schedule for the analysis of samples-body fluids according to the different states of the patients is explained. Moreover, important advances on leukemia coupled to proteomics tools are also explained. The final goal is to stimulate pediatric ALL research via proteomics in order to "build" the reference map of the signalling-networks from leukemic cells at relapse, thus significant clinical and therapy advances for ALL-relapse can be achieved.

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