Title: UPLC-MS based integrated plasma proteomic and metabolomic profiling of TSC-RAML and its relationship with everolimus treatment

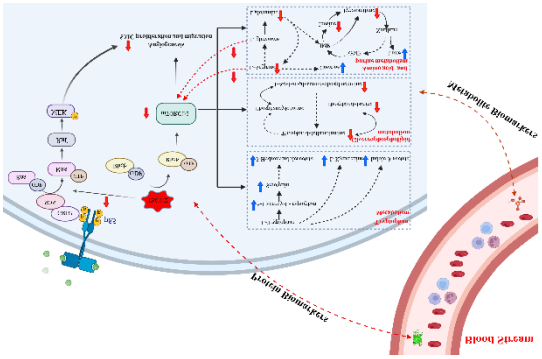
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Abstract (300 words limit)

Aim: To profile the plasma proteomics and metabolomics of patients with renal cysts, sporadic angiomyolipoma (S-AML) and tuberous sclerosis complex related angiomyolipoma (TSC-RAML) before and after everolimus treatment, and to find potential diagnostic and prognostic biomarkers as well as reveal the underlying mechanism of TSC tumorigenesis. **Materials and Methods:** We retrospectively measured the plasma proteins and metabolites from November 2016 to November 2017 in a cohort of pre-treatment and post-treatment TSC-RAML patients and compared them with renal cyst and S-AML patients by ultra-performance liquid chromatography-mass spectrometer (UPLC-MS). The tumor reduction rates of TSC-RAML were assessed and correlated with the plasma protein and metabolite levels. In addition, functional analysis based on differentially expressed molecules was performed to reveal the underlying mechanisms. **Results:** Eighty-five patients with one hundred and ten plasma samples were enrolled in our study. Multiple proteins and metabolites, such as pre-melanosome protein (PMEL) and S-adenosylmethionine (SAM), demonstrated both diagnostic and prognostic effects. Functional analysis revealed many dysregulated pathways, including angiogenesis synthesis, smooth muscle proliferation and migration, amino acid metabolism and glycerophospholipid metabolism. **Conclusions:** The plasma proteomics and metabolomics pattern of TSC-RAML was clearly different from that of other renal tumors, and the differentially expressed plasma molecules could be used as prognostic and diagnostic biomarkers. The dysregulated pathways, such as angiogenesis and amino acid metabolism, may shed new light on the treatment of TSC-RAML.

Image



Recent Publications (minimum 5)

1. Wang, Z. (2023) UPLC-MS based integrated plasma proteomic and metabolomic profiling of TSC-RAML and its relationship with everolimus treatment. Front Mol Biosci 2023, 10.
2. Wang, Z. (2022) A multi-omics study of diagnostic markers and the unique inflammatory tumor micro-environment involved in tuberous sclerosis complex-related renal angiomyolipoma. International journal of oncology 2022, 61(5).
3. Wang X. (2022) Analysis of Clinical Features and Next-Generation Sequencing of 12 Tuberous Sclerosis Families in China. Frontiers in medicine 2022, 9:840709.
4. Wang W. (2022) Analysis of serum lipid parameters predicting lipid metabolic disorders in TSC-AML patients with treatment of mTOR inhibitors. Journal of clinical pharmacy and therapeutics 2022, 47(7):979-985.
5. Wang W. (2022) A Multi-Centric Study Assessing Safety and Efficacy of Everolimus in Adult Chinese Patients With Tuberous Sclerosis Complex Associated Renal Angiomyolipomas. Frontiers in oncology 2022, 12:871723.

Photograph



Dr Yushi ZHANG has his expertise in benign and malignant urinary tumors, especially in the field of tuberous sclerosis complex related angiomyolipoma (TSC-RAML). He has conducted the first clinical trial regarding mTOR inhibitors, everolimus, on the treatment of TSC-RAML in China, which has laid the basis for the indications of everolimus on TSC-RAML. In addition, he has also published a large quantity of clinical and experimental articles regarding TSC-RAML.

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