trophoresis. Protein expressions and localizations of DVL1, DVL2 and DVL3 proteins were analyzed by immunohistochemistry.

In this study, results showed that DVL expression is significantly higher in astrocytomas than in normal brain tissue. Furthermore, expression increases with the pathological grade of tumors.

DVLs may play a important role in formation and invasion of astrocytic brain tumors. Future studies using an expanded cohort may help to improve the understanding of the role of individual DVL in astrocytoma as well as its potential as a molecular diagnostic marker or a therapeutic target.

Keywords: DVL1; DVL2; DVL3; Wnt signaling pathway; astrocytic brain tumors.

EXPRESSION OF SURVIVIN IN INVASIVE AND NONINVASIVE UROTHELIAL CARCINOMA OF THE URINARY BLADDER

Jasna Bacalja [1], Tihana Džombeta [2,3], Monika Ulamec [2,3], Borislav Spajić [2,4], Igor Grubišić [4], Božo Krušlin [2,3]

[1] Clinical Department of Pathology and Cytology, Dubrava University Hospital, Zagreb, Croatia; [2] School of Medicine, University of Zagreb, Zagreb, Croatia; [3] Ljudevit Jurak Department of Pathology, Sestre Milosrdnice Clinical Hospital Center, Zagreb, Croatia; [4] Department of Urology, SestreMilosrdnice Clinical Hospital Center, Zagreb, Croatia

Objective: The inhibitor of apoptosis protein survivin regulates apoptosis and cell cycle.There are conflicting data in the literature regarding relationship between the degree and localisation of survivin expression and behavior of urinary bladder carcinoma. Here, we correlated immunohistochemical localization of survivin with the histologic diagnosis of noninvasive and invasive urothelial carcinoma of the bladder (UCB).

Methods: A total of 82 histopathologically confirmed UCB were recruited. Of these 32 were non-invasive, 27 had invasion of lamina propria and 23 had confirmed invasion ofmuscularispropria of the urinary bladder. Immunohistochemistry was used to detect survivinexpression in tumor tissues. The intensity of the reactions was assessed semiquantitatively, using three expression categories; 0-5% (low expression), >5%-50% (moderate expression), and >50% (high expression).

Results: Higher survivin expression was found in less invasive UCB (p=-0,011 for nuclear and p<-0.001for cytoplasmic expression) and in UCB with lower histological grade (p=-0,018for nuclear and p<-0.001 for cytoplasmic expression).

Conclusions: Our results suggested that high survivin expression was associated with tumor stage and grade in UCB. Further studies are needed to conclude if survivin expression can be used as a diagnostic or prognostic marker for UCB.

***Keywords*:** surviving; urothelial carcinoma; urinary bladder; immunohistochemistry.

EPIGENETIC AGENTS INFLUENCE PROLIFERATION AND APOPTOSIS IN MOUSE TERATOCARCINOMA IN VITRO

Jure Krasić [1], Robert Buljubašić [2], Maja Buljubašić [3], Ana Katušić [1], Maja Vlahović [1], Florijana Bulić-Jakuš [1], Monika Ulamec [4,5], Nino Sinčić [1]

[1] University of Zagreb, School of Medicine, Department of Medical Biology, Laboratory for Epigenetics and Molecular Medicine, Zagreb, Croatia; [2] CH Dubrava, Clinical Department of Surgery; [3] Community Health Centre, Zagreb East; [4] Department of Clinical Pathology "Ljudevit Jurak" UHC Sestre Milosrdnice; [5] University of Zagreb, School of Medicine, Pathology Department

Testicular Germ Cell Tumours (TGCT), although rare, are the most frequent malignancies in young male population and believed to be initiated by epimutations, i.e. aberrant epigenetics, already *in utero*. Among various, teratoma is the most differentiated TGCT type encompassing all three germ layer derived tissues. Mouse teratoma is a well-established *in vitro* model which may be obtained by cultivating 7,5–days-old C3H mouse embryos and represent an ideal system to investigate the effect of the most prominent epigenetic drugs and agents.

After embryo isolation, they were treated for two hours with 5-azacytidine, Trichostatin A, Valproat, esiNanog, esiOct3/4 and esiTrrap, respectively. Embryos/teratomas treated with esiGFP served as a negative control. The embryos/teratomas were measured on day 0 and for the consequent 7 days of culturing, after which teratomas were scrapped, Sainte-Marie fixed and paraffin embedded for IHC analyses.

Epigenetic drugs and agents reduced significantly teratoma growth, with the exception of esiNanog and esiTrrap. Most prominent decrease in growth was determined in 5-azaC and esiOct3/4 treated embryos/teratomas.