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## Migration of new neurons towards the injured brain tissue

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Neurons continue to be born in the subventricular zone (SVZ) of the lateral ventricles of adult animals including rodents and primates. In this symposium, I will present how migration of these new neurons is guided in the normal and injured adult brain. In the normal brain, newborn neurons form a complex network of chains within the SVZ and migrate through the rostral migratory stream (RMS) into the olfactory bulb (OB). In the OB, these cells differentiate into olfactory interneurons. To study neuronal migration after brain injury, we used a mouse model of middle cerebral artery occlusion in combination with cre-loxP-based cell tracing methods. In this model, GFAP-expressing stem cells in the SVZ regenerate new striatal neurons in the damaged

brain tissue. Migration of these new neurons towards the site of injury is dependent on blood vessel scaffold and diffusible signaling molecules. Furthermore, new neurons produce a repulsive factor that alters the morphology of surrounding astrocytes to clear their way for efficient migration. Thus, the mechanism of neuronal migration in the injured adult brain is more complex than previously thought and than those in the embryonic and adult normal brain. For the development of successful neuroregenerative therapies, it is essential to understand more precisely and comprehensively the mechanisms that regulate neurogenesis and neuronal migration in both physiological and pathological conditions.