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EDITORIAL

Intracellular lysophosphatidic acid influences cell migration

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Altered cellular metabolism has been intensively studied in relation to carcinogenesis and tumor development (Currie et al. 2013; Pavlova and Thompson 2016; Santos and Schulze 2012). However, relatively, little is known about the mechanisms how choline metabolism influences the tumor phenotype (Okazaki et al. 2010; Glunde et al. 2015; Granata et al. 2014, 2015; Marchan et al. 2012; Ghallab 2014; Hassan 2017). In the September issue of Cancer Research, a new concept has been presented how choline metabolism influences the phenotype of tumor cells (Marchan et al. 2017): the intracellular concentration of the signaling lipid lysophosphatidic acid (LPA) is critical for tumor cell migration. In the first step, the authors overexpressed and knocked down glycerol-3-phosphate acetyltransferase 1 (GPAM) in tumor cell lines. This influenced intracellular concentrations of LPA, which was associated with higher or lower migration activity. However, the casual relationship between intracellular LPA and migration was established by an elegant method. This technique allows the direct introduction of LPA into cells by a cationic transfection reagent (Marchan et al. 2017). This experiment formally proved that tumor cell migration is stimulated by increased intracellular LPA concentrations. This finding is conceptually new because so far LPA was only known to act via extracellular receptors.

In the past decades, numerous factors have been shown to influence prognosis of carcinomas, such as the humoral and cellular immune system (Schmidt et al. 2008; Heimes et al. 2017a, b; Godoy et al. 2014), cytoskeleton (Hellwig et al. 2016; Stock et al. 2015), redox system (Cadenas et al. 2010), and circulation clock-associated factors (Cadenas et al. 2014). The observation that intracellular choline metabolites influence tumor cell migration and adhesion is relatively new and the responsible mechanisms have not yet been fully elucidated (Stewart et al. 2012; Marchan et al. 2012; Lesjak et al. 2014). The recently discovered mechanism of intracellular LPA adds a new aspect of how choline metabolism contributes to the phenotype of tumor cells.

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