

1135-VN-3186      **Molly Hoch** and **Samuel A Muthiah\*** ([samuel.a.muthiah@gmail.com](mailto:samuel.a.muthiah@gmail.com)), 2056 Sinaloa Avenue, Altadena, CA 91001, and **Nida Obatake**. *On the identification of  $k$ -inductively pierced codes using toric ideals.*

Neural codes are binary codes in  $\{0,1\}^n$ ; here we focus on the ones which represent the firing patterns of a type of neurons called place cells. There is much interest in determining which neural codes can be realized by a collection of convex sets. However, drawing these convex sets, particularly as the number of neurons in a code increases, can be very difficult. It has been shown that an algorithm for drawing Euler diagrams can be used to draw a class of codes that are said to be  $k$ -inductively pierced for  $k = 0, 1, 2$ . We use the toric ideal to show sufficient conditions for a code to be 1- or 2-inductively pierced, so that we may use the existing algorithm to draw realizations of 2-inductively pierced codes. (Received September 27, 2017)