Molly Hoch and Samuel A Muthiah* (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)