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Bursts of activity in collective cell migration CATERINA LA PORTA, Univ of Milan, OLEKSANDR CHEPIZHKO, Aalto University, COSTANZA GIAMPIETRO, ELEONORA MASTRAPASQUA, Univ of Milan, MEHDI NOURAZAR, Aalto University, MIRIAM ASCAGNI, MICHELA SUGNI, UMBERTO FASCIO, LIVIO LEGGIO, CHIARA MALINVERNO, GIORGIO SCITA, Univ of Milan, STEPHANE SANTUCCI, CNRS, Lyon, MIKKO ALAVA, Aalto University, STEFANO ZAPPERI, Univ of Milan — Dense monolayers of living cells display intriguing relaxation dynamics, reminiscent of soft and glassy materials close to the jamming transition, and migrate collectively when space is available, as in wound healing or in cancer invasion. Here we show that collective cell migration occurs in bursts that are similar to those recorded in the propagation of cracks, fluid fronts in porous media and ferromagnetic domain walls. In analogy with these systems, the distribution of activity bursts displays scaling laws that are universal in different cell types and for cells moving on different substrates. The main features of the invasion dynamics are quantitatively captured by a model of interacting active particles moving in a disordered landscape. Our results illustrate that collective motion of living cells is analogous to the corresponding dynamics in driven, but inanimate, systems.

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