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Title: A mathematical model for tumor angiogenesis with a travelling wave structure.

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Abstract.

The talk reviews a recent investigation on the onset of a vessel network in a tumor, stimulated by the emission of tumor angiogenesis factors by the cells that find themselves in a hypoxic state. The tumor invades the surrounding hosting tissue aggressing the normal cells. This creates an interface, which turns out to be the most active regions for angiogenesis and which propagates as a travelling wave. The angiogenic process is governed by chemotaxis, whose modeling differs considerably from the classical gradient driven one for two reasons: (i) the velocity of the cells progressively creating the new vessels has a physiological upper bound, (ii) a random change of direction creates a diffusion component. Numerical simulations provide a good match with experimental data. Some new considerations about the travelling wave structure of the solution are provided.