

## Duality in physiological time: Euclidean and fractal

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The aim of the present study was to differentiate two modalities of intrinsic time scales : i- the geometric or Euclidean modality, which is based on the constant speed of mass transport or of wave transmission in cylindrical structures (arteries, veins, nerves), whose allometric exponent ( $T(E) = aMb$ ) is  $b = 0.33$ , where  $M$  is body mass (kg) and  $a$  the mass coefficient; ii- the fractal time scale ( $T(F)$ ), which is characteristic of organs with self-similar branching structures and with volume-specific flows, whose allometric exponent is  $b = 0.25$ . The proposed dichotomy could be confirmed by means of the statistical analysis of empirical allometric exponents ( $b$ ). Our findings demonstrate the need to separate the chronology of bulk transport at long distances (inter-organic) which operates at short distances (intra-organic) and is represented by a self-similar branching system which determines both the morphometric and physiometric characteristics within each organ.