



Timing, Controls and Tectonic Context of Gold Mineralisation in the Southern Uplands-Longford-Down Terrane, Caledonides, Scotland and Ireland.

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The relationships between regional tectonic, magmatic and metamorphic events and hydrothermal mineralisation in orogenic settings are controversial [1]. The geotectonic development of the Caledonian orogenic belt of the northern British Isles, which hosts some significant gold deposits, is well-constrained and provides an excellent framework for investigating these relationships. Gold mineralisation at two of the best known deposits, Curraghinalt and Cononish, located in the Grampian Terrane, has recently been shown to have occurred between 462.7 and 452.8 Ma, during the Late Ordovician Grampian event of the Caledonian orogeny [2]. In the Southern Uplands-Longford-Down Terrane syn and post-kinematically intrusions constrain the age of mineralisation to between 418 and 397 Ma. Mineralisation is hosted by late Caledonian transverse D3 structures of Early Devonian age [3]. Fluid inclusion data indicate that the auriferous quartz veins were deposited from a low salinity carbonic mesothermal (~330°C) fluid of apparently mixed magmatic-metamorphic origin, consistent with a Caledonian orogenic origin [4-6]. Gold mineralisation is associated with contemporaneous minor intrusions at several localities [7-9] exhibiting comparable mineralogy, geochemistry, fluid inclusion types and structural relationships, indicating that coeval regional magmatism may have been a significant factor for all of the deposits. Gold mineralisation in the SULDT occurred during a transition from compression to strike-slip deformation coeval with a regional pulse of orogenic magmatism [10]. The common association between gold deposits in Phanerozoic orogenic settings and intrusions may explain overlapping characteristics between orogenic, intrusion-related and porphyry gold deposits and may reflect the important role of magmatism in conveying the heat to drive hydrothermal systems at shallow crustal levels. Further work will focus on constraining the sources of mineralising fluids and metals.

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