**Title:** Supplementary Data 1:

**Description:** Per-base editing efficiencies and editing outcome proportions derived from high-throughput base editing screens. This file provides the basis for training and testing the BE-DICT models for the respective base editor.

**Title:** Supplementary Data 2:

**Description:** Editing rates measured at endogenous genomic loci upon base editing.

**Title:** Supplementary Data 3:

**Description:** Datasets for the performance evaluation of BE-DICT, BE-Hive and DeepBaseEditor. This file contains datasets from this study as well as datasets derived from the respective publications accompanying the publicly available models (Arbab et al., 2020; Song et al., 2020).