**Figure S1** Radial Mendelian randomization plots displaying the relationship of

serum vitamin D levels on t benign parathyroid adenoma. The horizontal axis is the square root of the actual weight each SNP receives in the IVW analysis. The vertical-axis scale represents the ratio estimate for each SNP multiplied by the same square-root weight. The radial curves represent the ratio estimates for each SNP as well as the overall IVW estimates.

**Figure S2** Radial Mendelian randomization plots displaying the relationship of

thyroid cancer on serum vitamin D levels. The horizontal axis is the square root of the actual weight each SNP receives in the IVW analysis. The vertical-axis scale represents the ratio estimate for each SNP multiplied by the same square-root weight. The radial curves represent the ratio estimates for each SNP as well as the overall IVW estimates.

**Figure S3** Radial Mendelian randomization plots displaying the relationship of

chronic thyroiditis on serum vitamin D levels. The horizontal axis is the square root of the actual weight each SNP receives in the IVW analysis. The vertical-axis scale represents the ratio estimate for each SNP multiplied by the same square-root weight. The radial curves represent the ratio estimates for each SNP as well as the overall IVW estimates.

**Figure S4** Radial Mendelian randomization plots displaying the relationship of

thyroid nodule on serum vitamin D levels. The horizontal axis is the square root of the actual weight each SNP receives in the IVW analysis. The vertical-axis scale represents the ratio estimate for each SNP multiplied by the same square-root weight. The radial curves represent the ratio estimates for each SNP as well as the overall IVW estimates.