$$|0\rangle|00\rangle = |0\rangle|0\rangle|0\rangle = |0\rangle\otimes|0\rangle\otimes|0\rangle$$

$$|\Psi_2\rangle = \frac{1}{2}\alpha\left(|0\rangle + |1\rangle\right)\left(|00\rangle + |11\rangle\right) + \frac{1}{2}\beta\left(|0\rangle - |1\rangle\right)\left(|10\rangle + |01\rangle\right)$$

$$= \frac{1}{2}\Big(\alpha|000\rangle + \alpha|011\rangle + \alpha|100\rangle + \alpha|111\rangle$$

$$+ \beta|010\rangle + \beta|001\rangle - \beta|110\rangle - \beta|101\rangle\Big)$$

$$= \frac{1}{2}\Big(|00\rangle\left(\alpha|0\rangle + \beta|1\rangle\right) + |01\rangle\left(\alpha|1\rangle + \beta|0\rangle\right) + \dots\Big)$$

$$H\left(|0\rangle + |1\rangle\right) = \frac{1}{\sqrt{2}}\left(|0\rangle + |1\rangle\right) + \frac{1}{\sqrt{2}}\left(|0\rangle - |1\rangle\right)$$