Enroll. 
$$(1\times)$$

$$\mathbf{s} \leftarrow \text{POK} \qquad \qquad \mathbf{h} \leftarrow \text{FE.Gen}(\mathbf{s})$$

$$\mathbf{E} \leftarrow \bar{\Psi}_{\alpha}$$

$$\mathbf{r} \leftarrow \text{TRNG}()$$

$$\text{seed}_{\mathbf{a}'} \leftarrow \text{TRNG}()$$

$$\mathbf{X} \leftarrow \text{TRNG}()$$

$$\mathbf{b}' \leftarrow \text{LFSR}(\text{seed}_{\mathbf{a}'})^T \mathbf{s} + \mathbf{E}^T \mathbf{X} + \mathbf{r} \lfloor q/2 \rfloor$$

$$ch \leftarrow (\text{seed}_{\mathbf{a}'}, \mathbf{b}')$$

$$\text{DB} = (\mathbf{s}, \mathbf{h}, \mathbf{E}, ch, \mathbf{r})$$

Authenticate. 
$$(\infty)$$

$$\mathbf{s}_R \leftarrow \text{POK}$$
  $\qquad \qquad \mathbf{h}, ch$ 

$$\mathbf{s} \leftarrow \text{FE.Rec}(\mathbf{s_R}, \mathbf{h})$$

$$\mathbf{r}_R \leftarrow \mathrm{PUF}(ch, \mathbf{s})$$
 accept if  $\mathrm{HD}(\mathbf{r}_R, \mathbf{r}) < th$