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| **Table S1. List of primers for qPCR experiments** | | |
| **Gene Name** | **Forward primer(5’-3’)** | **Reverse primer(5’-3’)** |
| **Maspin** | **CTACTTTGTTGGCAAGTGGATGAA** | **ACTGGTTTGGTGTCTGTCTTGTTG** |
| **TMPRSS2** | **CTGGTGGCTGATAGGGGAT** | **GTCTGCCCTCATTTGTCGAT** |
| **KLK2** | **AGCCTGCCAAGATCACAGAT** | **GGAAGAACTCCTCTGGTTCG** |
| **FASN** | **AGGATCACAGGGACAACCTG** | **ACTCCACAGGTGGGAACAAG** |
| **FKBP5** | **TCCCTCGAATGCAACTCTCT** | **GCCACATCTCTGCAGTCAAA** |
| **PSA** | **AGGTCAGCCACAGCTTCCCA** | **GGGCAGGTCCATGACCTTCA** |
| **ING3** | **CAGCCAGTGAACAATCACCAT** | **CAGCACAGACACGTTCCTCT** |
| **GUSB** | **CGTCCCACCTAGAATCTGCT** | **TTGCTCACAAAGGTCACAGG** |
| **NKX3.1** | **GTACCTGTCGGCCCCTGAACG** | **GCTGTTATACACGGAGACCAGG** |
| **Actin** | **GAACCCTAAGGCCAACCGTGA** | **AGGAAGAGGATGCGGCAGTGG** |
| **Snail** | **ACTGCAACAAGGAATACCTCAG** | **GCACTGGTACTTCTTGACATCTG** |
| **Twist1** | **GTCCGCAGTCTTACGAGGAG** | **GCTTGAGGGTCTGAATCTTGCT** |
| **Ecadherin** | **ATTTTTCCCTCGACACCCGAT** | **TCCCAGGCGTAGACCAAGA** |

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| **Table S2. Patient characteristics in prostate cancer cohort and the derived datasets** | | | |
| **Characteristic** | **Derivation Dataset** | **Validation Dataset** | **Combined** |
|  | **n=133** | **n=123** | **n=256** |
| **Age at diagnosis** | **55-97** | **54-96** | **54-97** |
| **Death** | **Survived: 107** | **Survived: 94** | **Survived: 200** |
| **PCa-Related death: 23** | **PCa-Related death: 22** | **PCa-Related death: 45** |
| **Missing: 3** | **Missing: 7** | **Missing: 10** |
| **CRPC** | **PCA: 100** | **PCA: 96** | **PCA: 195** |
| **CRPC: 32** | **CRPC: 27** | **CRPC: 59** |
| **Missing: 1** | **Missing: 1** | **Missing: 2** |
| **Gleason Score** | **=< 7 : 63** | **=< 7 : 60** | **=< 7 : 122** |
| **> 7 : 67** | **> 7 : 59** | **> 7 : 126** |
| **Missing: 3** | **Missing: 4** | **Missing: 7** |
| **AR expression** | **Low: 60** | **Low: 57** | **Low: 117** |
| **High: 73** | **High: 66** | **High: 138** |
| **ERG expression** | **= 0: 101** | **= 0: 88** | **= 0: 188** |
| **> 0: 29** | **> 0: 33** | **> 0: 62** |
| **Missing: 3** | **Missing: 2** | **Missing: 5** |
| **ING3 expression** | **< 1.66: 83** | **< 1.66: 72** | **< 1.66: 155** |
| **> 1.66: 50** | **> 1.66: 51** | **> 1.66: 101** |

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| **Table S3. Cox proportional hazard model for Derivation dataset** | | | | | |
| **Covariate** | **Coefficient** | **SE** | **p-value** | **Hazard Ratio** | **95% CI** |
| **ING3** | **1.197** | **0.52** | **0.021** | **3.309** | **1.193-9.173** |
| **Age** | **-0.36** | **0.031** | **0.247** | **0.965** | **0.908-1.025** |
| **CRPC** | **1.778** | **0.541** | **0.001** | **5.915** | **2.047-17.090** |
| **Gleason Score** | **2.426** | **0.731** | **0.001** | **11.31** | **2.699-47.393** |
| **AR expression** | **-0.314** | **0.532** | **0.555** | **0.73** | **0.257-2.073** |
| **ERG expression** | **-1.768** | **0.697** | **0.011** | **0.171** | **0.044-0.669** |

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| **Table S4. Cox proportional hazard model for Validation dataset** | | | | | |
| **Covariate** | **Coefficient** | **SE** | **p-value** | **Hazard Ratio** | **95% CI** |
| **ING3** | **0.944** | **0.471** | **0.045** | **2.571** | **1.022-5.468** |
| **Age** | **0.016** | **0.026** | **0.538** | **1.016** | **0.966-1.069** |
| **CRPC** | **1.067** | **0.494** | **0.031** | **2.906** | **1.102-7.659** |
| **Gleason Score** | **1.709** | **0.714** | **0.017** | **5.524** | **1.363-22.383** |
| **AR expression** | **0.549** | **0.534** | **0.305** | **1.731** | **0.607-4.934** |
| **ERG expression** | **0.556** | **0.535** | **0.299** | **1.743** | **0.611-4.976** |