**Supplementary material 1. Full electronic search strategy in MEDLINE (PubMed).**

| **Search** | **Query** | **Items found** |
| --- | --- | --- |
| [#10](https://www.ncbi.nlm.nih.gov/pubmed/advanced) | Search **((((((((“Urinary Bladder Neoplasms”[Mesh]) OR (((((((((((“Urinary Bladder Neoplasm”[Title/Abstract]) OR “Urinary Bladder Neoplasms”[Title/Abstract]) OR “Bladder Neoplasm”[Title/Abstract]) OR “Bladder Neoplasms”[Title/Abstract]) OR “Bladder Tumor”[Title/Abstract]) OR “Bladder Tumors”[Title/Abstract]) OR “Bladder Cancer”[Title/Abstract]) OR “Cancer of Bladder”[Title/Abstract]) OR “Cancer of the Bladder”[Title/Abstract]) OR “Urinary Bladder Cancer”[Title/Abstract]) OR “Tumor of Urinary Bladder”[Title/Abstract]))) OR ((“Urethral Neoplasms”[Mesh]) OR ((((((((“Urethra Neoplasm”[Title/Abstract]) OR “Urethra Neoplasms”[Title/Abstract]) OR “Urethra Cancer”[Title/Abstract]) OR “Urethral Cancer”[Title/Abstract]) OR “Cancer of Urethra”[Title/Abstract]) OR “Cancer of Urethral”[Title/Abstract]) OR “Cancer of the Urethra”[Title/Abstract]) OR “Cancer of the Urethral”[Title/Abstract])))) OR (((((“Urinary Bladder”[Mesh]) OR “Urethra”[Mesh]) OR ((((((bladder[Title/Abstract]) OR intravesical[Title/Abstract]) OR urothelial[Title/Abstract]) OR urethra\*[Title/Abstract]) OR urothelium[Title/Abstract]) OR urinary[Title/Abstract]))) AND ((“Neoplasms”[Mesh]) OR ((((((neoplasm\*[Title/Abstract]) OR cancer[Title/Abstract]) OR malignant[Title/Abstract]) OR carcinoma[Title/Abstract]) OR tumor[Title/Abstract]) OR Malignancy[Title/Abstract])))))) AND (((((((((“atezolizumab” [Supplementary Concept]) OR “avelumab” [Supplementary Concept]) OR “durvalumab” [Supplementary Concept]) OR “pembrolizumab” [Supplementary Concept]) OR “Nivolumab”[Mesh]) OR “tremelimumab” [Supplementary Concept]) OR “Ipilimumab”[Mesh])) OR (((((((Atezolizumab[Title/Abstract]) OR Avelumab[Title/Abstract]) OR Durvalumab[Title/Abstract]) OR Pembrozumab[Title/Abstract]) OR Nivolumab[Title/Abstract]) OR Tremelimumab[Title/Abstract]) OR Ipilimumab[Title/Abstract]))** Filters: **Publication date from 2010/01/01 to 2020/12/31** | [456](https://www.ncbi.nlm.nih.gov/pubmed/?cmd=HistorySearch&querykey=10) |
| [#9](https://www.ncbi.nlm.nih.gov/pubmed/advanced) | Search **((((((((“Urinary Bladder Neoplasms”[Mesh]) OR (((((((((((“Urinary Bladder Neoplasm”[Title/Abstract]) OR “Urinary Bladder Neoplasms”[Title/Abstract]) OR “Bladder Neoplasm”[Title/Abstract]) OR “Bladder Neoplasms”[Title/Abstract]) OR “Bladder Tumor”[Title/Abstract]) OR “Bladder Tumors”[Title/Abstract]) OR “Bladder Cancer”[Title/Abstract]) OR “Cancer of Bladder”[Title/Abstract]) OR “Cancer of the Bladder”[Title/Abstract]) OR “Urinary Bladder Cancer”[Title/Abstract]) OR “Tumor of Urinary Bladder”[Title/Abstract]))) OR ((“Urethral Neoplasms”[Mesh]) OR ((((((((“Urethra Neoplasm”[Title/Abstract]) OR “Urethra Neoplasms”[Title/Abstract]) OR “Urethra Cancer”[Title/Abstract]) OR “Urethral Cancer”[Title/Abstract]) OR “Cancer of Urethra”[Title/Abstract]) OR “Cancer of Urethral”[Title/Abstract]) OR “Cancer of the Urethra”[Title/Abstract]) OR “Cancer of the Urethral”[Title/Abstract])))) OR (((((“Urinary Bladder”[Mesh]) OR “Urethra”[Mesh]) OR ((((((bladder[Title/Abstract]) OR intravesical[Title/Abstract]) OR urothelial[Title/Abstract]) OR urethra\*[Title/Abstract]) OR urothelium[Title/Abstract]) OR urinary[Title/Abstract]))) AND ((“Neoplasms”[Mesh]) OR ((((((neoplasm\*[Title/Abstract]) OR cancer[Title/Abstract]) OR malignant[Title/Abstract]) OR carcinoma[Title/Abstract]) OR tumor[Title/Abstract]) OR Malignancy[Title/Abstract])))))) AND (((((((((“atezolizumab” [Supplementary Concept]) OR “avelumab” [Supplementary Concept]) OR “durvalumab” [Supplementary Concept]) OR “pembrolizumab” [Supplementary Concept]) OR “Nivolumab”[Mesh]) OR “tremelimumab” [Supplementary Concept]) OR “Ipilimumab”[Mesh])) OR (((((((Atezolizumab[Title/Abstract]) OR Avelumab[Title/Abstract]) OR Durvalumab[Title/Abstract]) OR Pembrozumab[Title/Abstract]) OR Nivolumab[Title/Abstract]) OR Tremelimumab[Title/Abstract]) OR Ipilimumab[Title/Abstract]))** | [457](https://www.ncbi.nlm.nih.gov/pubmed/?cmd=HistorySearch&querykey=9) |
| [#8](https://www.ncbi.nlm.nih.gov/pubmed/advanced) | Search **((((((“Urinary Bladder Neoplasms”[Mesh]) OR (((((((((((“Urinary Bladder Neoplasm”[Title/Abstract]) OR “Urinary Bladder Neoplasms”[Title/Abstract]) OR “Bladder Neoplasm”[Title/Abstract]) OR “Bladder Neoplasms”[Title/Abstract]) OR “Bladder Tumor”[Title/Abstract]) OR “Bladder Tumors”[Title/Abstract]) OR “Bladder Cancer”[Title/Abstract]) OR “Cancer of Bladder”[Title/Abstract]) OR “Cancer of the Bladder”[Title/Abstract]) OR “Urinary Bladder Cancer”[Title/Abstract]) OR “Tumor of Urinary Bladder”[Title/Abstract]))) OR ((“Urethral Neoplasms”[Mesh]) OR ((((((((“Urethra Neoplasm”[Title/Abstract]) OR “Urethra Neoplasms”[Title/Abstract]) OR “Urethra Cancer”[Title/Abstract]) OR “Urethral Cancer”[Title/Abstract]) OR “Cancer of Urethra”[Title/Abstract]) OR “Cancer of Urethral”[Title/Abstract]) OR “Cancer of the Urethra”[Title/Abstract]) OR “Cancer of the Urethral”[Title/Abstract])))) OR (((((“Urinary Bladder”[Mesh]) OR “Urethra”[Mesh]) OR ((((((bladder[Title/Abstract]) OR intravesical[Title/Abstract]) OR urothelial[Title/Abstract]) OR urethra\*[Title/Abstract]) OR urothelium[Title/Abstract]) OR urinary[Title/Abstract]))) AND ((“Neoplasms”[Mesh]) OR ((((((neoplasm\*[Title/Abstract]) OR cancer[Title/Abstract]) OR malignant[Title/Abstract]) OR carcinoma[Title/Abstract]) OR tumor[Title/Abstract]) OR Malignancy[Title/Abstract]))))** | [123455](https://www.ncbi.nlm.nih.gov/pubmed/?cmd=HistorySearch&querykey=8) |
| [#7](https://www.ncbi.nlm.nih.gov/pubmed/advanced) | Search **((((((((“atezolizumab” [Supplementary Concept]) OR “avelumab” [Supplementary Concept]) OR “durvalumab” [Supplementary Concept]) OR “pembrolizumab” [Supplementary Concept]) OR “Nivolumab”[Mesh]) OR “tremelimumab” [Supplementary Concept]) OR “Ipilimumab”[Mesh])) OR (((((((Atezolizumab[Title/Abstract]) OR Avelumab[Title/Abstract]) OR Durvalumab[Title/Abstract]) OR Pembrozumab[Title/Abstract]) OR Nivolumab[Title/Abstract]) OR Tremelimumab[Title/Abstract]) OR Ipilimumab[Title/Abstract])** | [8562](https://www.ncbi.nlm.nih.gov/pubmed/?cmd=HistorySearch&querykey=7) |
| [#6](https://www.ncbi.nlm.nih.gov/pubmed/advanced) | Search **((((((Atezolizumab[Title/Abstract]) OR Avelumab[Title/Abstract]) OR Durvalumab[Title/Abstract]) OR Pembrozumab[Title/Abstract]) OR Nivolumab[Title/Abstract]) OR Tremelimumab[Title/Abstract]) OR Ipilimumab[Title/Abstract]** | [6824](https://www.ncbi.nlm.nih.gov/pubmed/?cmd=HistorySearch&querykey=6) |
| [#5](https://www.ncbi.nlm.nih.gov/pubmed/advanced) | Search **((((((“atezolizumab” [Supplementary Concept]) OR “avelumab” [Supplementary Concept]) OR “durvalumab” [Supplementary Concept]) OR “pembrolizumab” [Supplementary Concept]) OR “Nivolumab”[Mesh]) OR “tremelimumab” [Supplementary Concept]) OR “Ipilimumab”[Mesh]** | [4891](https://www.ncbi.nlm.nih.gov/pubmed/?cmd=HistorySearch&querykey=5) |
| [#4](https://www.ncbi.nlm.nih.gov/pubmed/advanced) | Search **«Ipilimumab»[Mesh]** | [1790](https://www.ncbi.nlm.nih.gov/pubmed/?cmd=HistorySearch&querykey=4) |
| [#2](https://www.ncbi.nlm.nih.gov/pubmed/advanced) | Search **«tremelimumab» [Supplementary Concept]** | [134](https://www.ncbi.nlm.nih.gov/pubmed/?cmd=HistorySearch&querykey=2) |

**Supplementary material 2. Full search strategy in EMBASE.**

#8

#3 AND #7

[38](https://www.embase.com/)

#7

('urethra'/exp OR urethra) AND neoplasm\* OR (urethral AND neoplasm\*) OR 'urethra cancer'/exp OR 'urethra cancer' OR (('urethra'/exp OR urethra) AND ('cancer'/exp OR cancer)) OR 'urethral cancer' OR (urethral AND ('cancer'/exp OR cancer)) OR 'cancer of urethra' OR (('cancer'/exp OR cancer) AND of AND ('urethra'/exp OR urethra)) OR 'cancer of the urethra' OR (('cancer'/exp OR cancer) AND of AND the AND ('urethra'/exp OR urethra))

[14,238](https://www.embase.com/)

#6

#5 AND (2010:py OR 2011:py OR 2012:py OR 2013:py OR 2014:py OR 2015:py OR 2016:py OR 2017:py OR 2018:py OR 2019:py OR 2020:py) AND ('article'/it OR 'article in press'/it OR 'review'/it)

[699](https://www.embase.com/)

#5

#3 AND #4

[1,364](https://www.embase.com/)

#4

'urinary bladder'/exp OR 'urinary bladder' OR (urinary AND ('bladder'/exp OR bladder) AND neoplasm\*) OR (('bladder'/exp OR bladder) AND neoplasm\*) OR (('bladder'/exp OR bladder) AND tumor\*) OR 'bladder cancer'/exp OR 'bladder cancer' OR (('bladder'/exp OR bladder) AND ('cancer'/exp OR cancer)) OR 'cancer of bladder' OR (('cancer'/exp OR cancer) AND of AND ('bladder'/exp OR bladder)) OR 'cancer of the bladder' OR (('cancer'/exp OR cancer) AND of AND the AND ('bladder'/exp OR bladder)) OR 'urinary bladder cancer'/exp OR 'urinary bladder cancer' OR (urinary AND ('bladder'/exp OR bladder) AND ('cancer'/exp OR cancer)) OR 'tumor of urinary bladder' OR (('tumor'/exp OR tumor) AND of AND urinary AND ('bladder'/exp OR bladder))

[211,268](https://www.embase.com/)

#3

#1 OR #2

[27,801](https://www.embase.com/)

#2

atezolizumab:ab,ti OR avelumab:ab,ti OR durvalumab:ab,ti OR pembrozumab:ab,ti OR nivolumab:ab,ti OR tremelimumab:ab,ti OR ipilimumab:ab,ti

[16,370](https://www.embase.com/)

#1

'atezolizumab'/exp OR atezolizumab OR 'avelumab'/exp OR avelumab OR 'durvalumab'/exp OR durvalumab OR pembrozumab OR 'nivolumab'/exp OR nivolumab OR 'tremelimumab'/exp OR tremelimumab OR 'ipilimumab'/exp OR ipilimumab

[27,801](https://www.embase.com/)