### Supplement Table 1: Detailed patient characteristics

| Pt.-No. | Age | Histological Diagnosis | Metastasis (UICC abbr.) | Previous Pharmaco logical Therapies (italicized: after TAT, during kidney follow-up) | Previous PRRT Y-90/Lu-177/Bi-213 [GBq] |
|---------|-----|------------------------|-------------------------|---------------------------------------------------------------------------------|------------------------------------------|
| 1       | 85  | Gastric-NET G2 (Ki-67 10%) | hep, oss                | SSA, STZ/Doxo, Sun, Eve, Oxa/5-FU, SIRT                                         | 8 / 8 / 0                                 |
| 2       | 60  | Gastric-NEC G3 (Ki-67 30%) | hep, oss                | SSA, Eve, SIRT, STZ/5-FU                                                         | 6 / 12 / 0                                |
| 3       | 62  | Midgut-NET              | hep, oss                | SSA                                                                               | 0 / 0 / 0                                 |
| 4       | 73  | Midgut-NET              | lym, oss, hep           | SSA, Eve                                                                         | 16 / 20 / 0                               |
| 5       | 53  | Midgut-NET              | lym, per                | SSA                                                                               | 0 / 0 / 0                                 |
| 6       | 58  | Midgut-NET G2 (Ki-67 15%) | lym, hep, oss, per      | SSA, INF                                                                         | 0 / 0 / 0                                 |
| 7       | 65  | Midgut-NET G2 (Ki-67 15%) | lym, hep, oss           | SSA, Deno                                                                         | 6 / 4 / 0                                 |
| 8       | 73  | Midgut-NET G2 (Ki-67 6%) | lym, hep, oss           | SSA, Deno                                                                         | 12 / 0 / 0                                |
| 9       | 66  | Hindgut-NET             | hep, oss, lym           | SSA, Tem/Cap                                                                      | 0 / 0 / 0                                 |
| 10      | 52  | Hindgut-NET G2 (10%)    | lym, hep, oss           | SSA                                                                               | 10 / 6 / 0                                |
| 11      | 56  | p-NET                   | hep, oss, lym           | SSA                                                                               | 0 / 15 / 0                                |
| 12      | 49  | p-NET                   | lym, hep, oss           | SSA, STZ/Doxo, Sun, Eve, Oxa/5-FU, SIRT                                         | 11 / 1 / 0                                |
| 13      | 56  | p-NET                   | hep, oss                | SSA, Tem/Cap, Sun, Eve                                                           | 0 / 44 / 0                                |
| 14      | 55  | p-NET G2 (Ki-67 10%)    | oss, hep                | SSA, Eve, SIRT, STZ/5-FU                                                         | 12 / 20 / 0                               |
| 15      | 61  | p-NET G2 (Ki-67 10%)    | hep, oss, adr           | SSA                                                                               | 22 / 12 / 13                              |
| 16      | 56  | p-NET G2 (Ki-67 15%)    | lym, oss, hep           | STZ/5-FU                                                                          | 6 / 24 / 0                                |
| 17      | 64  | p-NET G2 (Ki-67 18%)    | hep, oss, pulm          | STZ/5-FU, Eve, Sun                                                               | 8 / 6 / 0                                 |
| 18      | 69  | p-NET G2(Ki-67 18%)     | lym, hep                | SSA, Sun                                                                         | 18 / 4 / 19                               |
| 19      | 17  | p-NET G3 (Ki-67 30%)    | lym, hep, per           | Tem/Thal, SSA, Sun                                                              | 6 / 19 / 0                                |
| 20      | 47  | p-NET G3 (Ki-67 30%)    | hep                    | SSA, STZ/5-FU, Tem/Cap/Bev, Cis/Eto, Eve, FOLFIRI/Bev/Nivo                     | 6 / 12 / 0                                |
| 21      | 73  | p-NEC (Ki-67 25%)       | hep, oss                | Cis/Eto, Topo, SIRT                                                              | 10 / 4 / 0                                |
| 22      | 47  | p-NEC (Ki-67 30%)       | hep, oss                | SSA                                                                               | 6 / 4 / 0                                 |
| 23      | 67  | atyp lung carcinoid     | hep                    | SSA                                                                               | 2 / 12 / 0                                |
| 24      | 34  | atyp lung carcinoid (Ki-67 10%) | hep, oss              | SSA, Doxo/Vincri/Cyclo, Eve                                                     | 14 / 16 / 15                              |
| 25      | 65  | atyp lung carcinoid (Ki-67 10%) | lym, hep, oss          | Carbo/Eto, SIRT                                                                 | 0 / 30 / 0                                |
| 26      | 58  | atyp lung carcinoid (Ki-67 20%) | oss                  | SSA                                                                               | 4 / 0 / 0                                 |
| 27      | 72  | atyp lung carcinoid (Ki-67 8%) | hep                  | SSA                                                                               | 0 / 0 / 4                                 |
| 28      | 72  | Lung-LCNEC (Ki-67 60%)  | lym, oss, hep           | SSA                                                                               | 14 / 6 / 0                                |
| 29      | 51  | CUP-NET G2 (Ki-67 15%)  | lym, hep, oss, oth      | SSA, TACE, FOLFOX, Eve, Sun                                                     | 16 / 8 / 0                                |
| 30      | 63  | CUP-NET G1              | oss, hep                | SSA                                                                               | 0 / 0 / 0                                 |
| 31      | 58  | CUP-NET G2              | lym, hep, oss           | SSA                                                                               | 0 / 18 / 0                                |
| 32      | 71  | CUP-NET G3 (Ki-67 25%)  | hep, oss                | SSA                                                                               | 6 / 14 / 0                                |
| 33      | 61  | Medullary thyroid carcinoma | oss                    | Van                                                                               | 0 / 0 / 0                                 |
| 34      | 52  | Medullary thyroid carcinoma | pulm, oss              | SSA                                                                               | 0 / 0 / 4                                 |
| 35      | 55  | Meningeoma atyp. (WHO II) |                       | SSA                                                                               | 0 / 0 / 0                                 |
| 36      | 38  | Merkel-cell carcinoma   | pulm, pleu, per         | Carbo/Eto, Pac, Ave                                                              | 3 / 15 / 0                                |
| 37      | 40  | Paranglioma             | oss, oth                | Cis/Eto, Cyclo/Vincri/DTIC, Sun                                                   | 2 / 2 / 0                                 |
| 38      | 66  | Prostate-NET (Ki-67 10%) | hep, oss                | SSA, Eve, Deno                                                                   | 6 / 12 / 4                                |
| 39      | 42  | Renal-NET G2 (Ki-67 5%) | lym, hep, oss           | SSA, INF, Deno                                                                   | 0 / 22 / 0                                |

SSA Somatostatin-Analogue, Eve Everolimus, Sun Sunitinib, STZ Streptozocin, 5-FU 5-Fluouracil, Doxo Doxorubicin, Tem Temozolomide, Cap Capecitabine, Thai Thalidomide, Cis Cisplatin, Carbo Carboplatin, Oxa Oxaliplatin, Eto Etoposide, Topo Topotecan, Vincr Vincristin, Cyclo Cyclophosphamide, Deno Denosumab, IFN Interferon, SIRT Selective Internal Radiotherapy, Van Vandetanib, Ave Avelumab, Pac Paclitaxel, DTIC Dacarbacin, FOLFOSX Oxa+5-FU, , FOLFIRI Irinotecan+5-FU, TACE Trans-Arterial Chemo-Embolization; NET Neuroendocrine Tumor, NEC Neuroendocrine Carcinoma, CUP Carcinoma of unknown primary, p-NET pancreatic NET.
| Pt.-No. | Gender | CKD risk factors                                                                 | Estimated kidney pre-dose [Gy]* |
|--------|--------|-----------------------------------------------------------------------------------|---------------------------------|
| 1      | f      | age >65, diabetes, hypertension, bisphosphonates                                  | 22                             |
| 2      | m      | CVD (septum defect), hypertension, ntCTX                                          | 21                             |
| 3      | m      | hypertension                                                                      | 0                              |
| 4      | m      | age >65, hypertension, carcinoid syndrom, targetedCTX                             | 48                             |
| 5      | m      | carcinoid syndrom                                                                | 0                              |
| 6      | f      | diabetes, hypertension, BMI >30, NSAID                                            | 0                              |
| 7      | f      | age >65, CVD (tricuspidal+mitral insuff.), carcinoid syndrom, Deno                 | 15                             |
| 8      | m      | age >65, CVD (tricuspidal+mitral replacement), carcinoid syndrom, hypertension, diabetes, Deno | 25                             |
| 9      | m      | age >65, CVD (ICD, infarction, EF 43%), hypertension                              | 0                              |
| 10     | m      | hypertension                                                                      | 25                             |
| 11     | m      | -                                                                                | 11                             |
| 12     | f      | CVD (septum defect), ntCTX                                                        | 24                             |
| 13     | m      | ntCTX, targetedCTX                                                                | 31                             |
| 14     | f      | ntCTX (breast cancer), bisphosphonates                                           | 39                             |
| 15     | f      | bisphosphonates                                                                  | 77                             |
| 16     | f      | hypertension, ntCTX                                                               | 29                             |
| 17     | f      | ntCTX                                                                            | 21                             |
| 18     | m      | age >65, hypertension, targetedCTX                                                | 73                             |
| 19     | f      | targetedCTX                                                                      | 26                             |
| 20     | m      | ntCTX                                                                            | 21                             |
| 21     | f      | age >65, ntCTX, NSAID                                                             | 24                             |
| 22     | m      | -                                                                                | 15                             |
| 23     | m      | age >65, diabetes, hypertension, bisphosphonates                                  | 13                             |
| 24     | f      | carcinoid syndrom, ntCTX                                                          | 66                             |
| 25     | m      | age >65, ntCTX                                                                    | 21                             |
| 26     | f      | hypertension                                                                      | 8                              |
| 27     | m      | age >65, hypertension, CVD                                                        | 7                              |
| 28     | m      | age >65, hypertension                                                              | 34                             |
| 29     | f      | ntCTX, targetedCTX                                                                | 39                             |
| 30     | m      | hypertension, CVD                                                                  | 0                              |
| 31     | m      | hypertension, BMI >30                                                             | 13                             |
| 32     | m      | age >65, hypertension, CVD, targetedCTX                                           | 22                             |
| 33     | m      | hypertension, CVD                                                                  | 0                              |
| 34     | m      | bisphosphonates                                                                   | 4                              |
| 35     | f      | -                                                                                | 0                              |
| 36     | m      | ntCTX                                                                            | 17                             |
| 37     | f      | bisphosphonates, ntCTX, targetedCTX                                               | 6                              |
| 38     | m      | age >65, bisphosphonates, NSAID, targetedCTX                                       | 28                             |
| 39     | m      | bisphosphonates, hypertension, s/p nephrectomy                                    | 15                             |

CVD cardio-vascular disease, NSAID >6 mo chronic intake of non-steroidal anti-inflammatory drugs, BMI body-mass-index, ntCTX chemo-therapy with known clinically relevant nephrotoxicity (e.g. platin), targetedCTX (no acute, but potentially indirect nephrotoxic potential of VEGF, mTOR or neoangiogenesis inhibitors)

*For patients without individual dose estimates for previous PRRT, a replacement dose assuming 0.7 Gy/GBq \(^{177}\text{Lu-DOTATOC}, 2.1 \text{Gy/GBq} ^{90}\text{Y-DOTATOC} \text{or 1.6 Gy/GBq} ^{213}\text{Bi-DOTATOC} \text{was used.}
**Supplement Table 3:** Sum activity of $^{225}$Ac-DOTATOC, fractioning and follow-up period

| Pt.-No. | Ac-225 sum [MBq] | 1. AcPRRT [MBq] IBC [mo] | 2. AcPRRT [MBq] IBC [mo] | 3. AcPRRT [MBq] IBC [mo] | 4. AcPRRT [MBq] IBC [mo] | 5. AcPRRT [MBq] IBC [mo] | Follow-up [mo] |
|---------|------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|----------------|
| 22      | 6                | 6                         |                           |                           |                           |                           | 3              |
| 19      | 7                | 7                         |                           |                           |                           |                           | >83            |
| 32      | 10               | 10                        |                           |                           |                           |                           | 5              |
| 12      | 18               | 12                        | 2                         | 6                         |                           |                           | 20             |
| 21      | 24               | 12                        | 14                        | 12                        |                           |                           | 24             |
| 28      | 58               | 18                        | 4                         | 40                        |                           |                           | 4              |
| 29      | 58               | 18                        | 4                         | 40                        |                           |                           | 12             |
| 7       | 38               | 19                        | 2                         | 19                        |                           |                           | 73             |
| 10      | 19               | 19                        |                           |                           |                           |                           | >83            |
| 20      | 19               | 19                        |                           |                           |                           |                           | 29             |
| 26      | 38               | 19                        | 6                         | 19                        |                           |                           | 61             |
| 30      | 74               | 19                        | 6                         | 19                        | 6                         | 19                        | >73            |
| 36      | 37               | 19                        | 2                         | 19                        |                           |                           | 4              |
| 38      | 38               | 19                        | 6                         | 19                        |                           |                           | 20             |
| 39      | 57               | 19                        | 4                         | 19                        | 6                         | 19                        | 44             |
| 4       | 20               | 20                        |                           |                           |                           |                           | 15             |
| 5       | 40               | 20                        | 4                         | 20                        |                           |                           | 15             |
| 15      | 20               | 20                        |                           |                           |                           |                           | 13             |
| 18      | 20               | 20                        |                           |                           |                           |                           | 25             |
| 25      | 91               | 20                        | 4                         | 20                        | 4                         | 13                        | 6              |
| 16      | 24               | 24                        |                           |                           |                           |                           | 1              |
| 6       | 75               | 25                        | 4                         | 25                        | 4                         | 25                        | 14             |
| 11      | 50               | 25                        | 4                         | 25                        |                           |                           | 42             |
| 13      | 74               | 25                        | 4                         | 25                        | 6                         | 24                        | 11             |
| 33      | 25               | 25                        |                           |                           |                           |                           | 7              |
| 34      | 25               | 25                        |                           |                           |                           |                           | >77            |
| 35      | 49               | 25                        | 4                         | 24                        |                           |                           | 69             |
| 17      | 49               | 30                        | 4                         | 19                        |                           |                           | 10             |
| 14      | 59               | 33                        | 2                         | 26                        |                           |                           | 14             |
| 2       | 35               | 35                        |                           |                           |                           |                           | 4              |
| 31      | 60               | 35                        | 4                         | 25                        |                           |                           | 55             |
| 8       | 80               | 40                        | 4                         | 40                        |                           |                           | 67             |
| 23      | 40               | 40                        |                           |                           |                           |                           | 69             |
| 1       | 50               | 50                        |                           |                           |                           |                           | 3              |
| 9       | 70               | 50                        | 4                         | 20                        |                           |                           | >83            |
| 27      | 87               | 50                        | 3                         | 19                        | 3                         | 16                        | 18             |
| 37      | 70               | 50                        | 4                         | 20                        |                           |                           | 60             |
| 3       | 95               | 55                        | 4                         | 40                        |                           |                           | 35             |
| 24      | 60               | 60                        |                           |                           |                           |                           | 1              |

*IBC Interval between cycles

* sorted by 1st cycle treatment radioactivity