CLAIMS

1. A recombinant adeno-associated virus (AAV) having an AAV capsid and packaged therein a heterologous nucleic acid which expresses at least two functional monospecific antibodies in a cell, wherein the recombinant AAV comprises:

a 5' AAV inverted terminal repeat (ITR);

a first expression cassette which encodes at least a first open reading frame (ORF) for a first immunoglobulin under the control of regulatory control sequences which direct expression thereof;

a second expression cassette which comprises a second ORF, a linker, and a third ORF under the control of regulatory control sequences which direct expression thereof, wherein the second and third ORF are for a second and third immunoglobulin construct; and

a 3' AAV ITR.

2. The recombinant AAV according to claim 1, wherein the recombinant AAV further expresses a bispecific antibody.

3. The recombinant AAV according to claim 1, wherein the recombinant AAV comprises a bidirectional enhancer located between the first expression cassette and the second expression cassette.

4. The recombinant AAV according to claim 1, wherein the first ORF encodes an immunoglobulin light chain, the second ORF encodes a first immunoglobulin heavy chain and third ORF encodes a second heavy chain, whereby the expressed functional antibody constructs have two different heavy chains with different specificities which share a light chain.

5. The recombinant AAV according to claim 1, wherein at least one of the second and third ORF contain modified Fc coding sequences.

6. The recombinant AAV according to claim 1, wherein the linker in the second cassette comprises a linker selected from an IRES or an F2A.

7. The recombinant AAV according to claim 1, wherein the regulatory control sequences for the first expression cassette and/or the second cassette comprise a minimal promoter.

8. The recombinant AAV according to claim 1, wherein the regulatory control sequences for the first expression cassette and/or the second expression cassette comprise a minimal or synthetic polyA.

9. The recombinant AAV according to claim 1, wherein the first expression cassette is bicistronic and comprises a further ORF.

10. The recombinant AAV according to claim 9, wherein each of the ORF comprise an scFv.

11. The recombinant AAV according claim 1, wherein the vector comprises a bidirectional polyA between the first expression cassette and the second expression cassette.

12. The recombinant AAV according to claim 10, wherein the first expression cassette comprises an enhancer and a minimal promoter.

13. The recombinant AAV according to claim 12, wherein the second expression cassette comprises an enhancer and a minimal promoter.

14. The recombinant AAV according to claim 8, wherein the first and second expression cassettes together express two Fabs.

15. The recombinant AAV according to claim 1, wherein the at least two antibody constructs have different specificities.

16. The recombinant AAV according to claim 1, wherein the at least two antibody constructs are independently selected from a monoclonal antibody, an immunoadhesin, a Fab, a bifunctional antibody, and combinations thereof.

17. A recombinant adeno-associated virus (AAV) having an AAV capsid and packaged therein a heterologous nucleic acid which expresses at least two functional monospecific antibodies in a cell, wherein the recombinant AAV expresses a first monoclonal antibody having a first specificity, a second monoclonal antibody having a specificity different from the first monoclonal antibody, and a bifunctional antibody, and wherein the recombinant AAV comprises:

a 5' AAV inverted terminal repeat (ITR);

a first expression cassette which encodes at least a first open reading frame (ORF) for a first immunoglobulin under the control of regulatory control sequences which direct expression thereof;

a second expression cassette which comprises a second ORF, a linker, and a third ORF under the control of regulatory control sequences which direct expression thereof, wherein the second and third ORF are for a second and third immunoglobulin construct; and

a 3' AAV ITR.

18. A pharmaceutical composition comprising a recombinant AAV according to claim 1 and pharmaceutically acceptable carrier.

19. The recombinant AAV according to claim 17, wherein the recombinant AAV comprises a bidirectional enhancer located between the first expression cassette and the second expression cassette.

20. The recombinant AAV according to claim 17, wherein the first ORF encodes an immunoglobulin light chain, the second ORF encodes a first immunoglobulin heavy chain and third ORF encodes a second heavy chain, whereby the expressed functional antibody constructs have two different heavy chains with different specificities which share a light chain.