Useful facts about tangles:

(1) Both $N(a/b)$ and $D(a/b)$ are 4-plats. The knot/link $N(a/b)$ is the 4-plat $S(a,-b)$. The knot/link $D(a/b)$ is the 4-plat $S(b,a)$.

(2) $N((c_1,...,c_n)) = N((c_n,...,c_1)) = N((c_1,...,c_n - 1, 1))$
$= N((1, c_1 - 1, ..., c_n))$

(3) The tangle corresponding to $\frac{a_1}{b_1}$ is the same as the tangle corresponding to $\frac{a_2}{b_2}$ if and only if $\frac{a_1}{b_1} = \frac{a_2}{b_2}$.

(4) The 4-plats $N(a_1/b_1)$ and $N(a_2/b_2)$, $a_i \geq 0$, are are the same if and only if $a_1 = a_2$ and $b_1 b_2^{\pm 1} \cong 1 \pmod{a_1}$.

i.e. $b_1 = b_2 \pmod{a_1}$ or $b_1 b_2 = 1 \pmod{a_1}$

or equivalently, $b_1 = b_2 \pmod{a_1}$ or $b_1 = b_2^{-1} \pmod{a_1}$

(5) The mirror image of $N(\frac{a}{b})$ is $N(-\frac{a}{b})$

(6) $N(\frac{a}{b})$ is achiral if and only if $b^2 \cong -1 \pmod{a}$ or $2b = 1 \pmod{a}$.

(7) $N(\frac{a_1}{b_1} + \frac{a_2}{b_2}) = N(\frac{a_1 b_2 + a_2 b_1}{a_1 b_2' + a_2' b_1})$ where $a_2' b_2 - a_2 b_2' = 1$ [5].

(8) $N(A + C) = N(C + A)$

(9) $A + C \neq C + A$

(10) $\frac{a_1}{b_1} + \frac{a_2}{b_2} \neq$ a rational tangle unless either $b_1 = \pm 1$ or $b_2 = \pm 1$.

(11) $\frac{a}{b} + t = \frac{a+bt}{b}$

(12) $D(A + C) = D(A) \# D(C)$.

(13) $N(\frac{a_1}{b_1} + ... + \frac{a_n}{b_n})$ is a Montesinos knot which is not a 4-plat unless at most two of the tangles $\frac{a_i}{b_i}$ are non-integral.

(14) N(A + C) = 4-plat implies at least one of A or C is rational or locally knotted [8][9].

(15) If A is a prime tangle and C is locally unknotted and not the ∞-tangle, then A + C is a prime tangle [9][10].

The tangle, C, is locally unknotted if every 3-ball which intersects the arcs of C in exactly two points contains an unknotted spanning arc. A tangle is locally knotted if it is not locally unknotted. A tangle is prime if it is neither rational nor locally knotted.

(16) R is a rational tangle if and only if its double branch cover is a solid torus.

(17) M a ambient isotopic to a sum of rational tangles if and only if its double branch cover is a Seifert fiber space with orbit surface a disk and $n > 0$ exceptional fibers [11].

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